NetSure™ LMS Data Processing Unit

Installation Instructions, Section 5879 (Issue BA, April 7, 2014)

Specification Number: 586505000 and 586505500
Model Number: LMS1000

Firmware Version 12.0

Also for the LMS Monitoring System factory integrated into Spec. Nos. 582140000, 582140001, and 582126100 NetSure™ Power Systems (NPS).

EMERSON
Network Power

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Table of Contents

Admonishments Used in this Document ..... **iv**
Static Warning ..... **v**
FCC Information ..... **vi**
General Information and Installation Checklist **1**
Preface 1
Installation Acceptance Checklist 1
Installing LMS1000 ..... **2**
Installing the LMS1000 Display Option 2
Mounting the 586505000/586505500 Main Cabinet and Expansion Cabinet(s) (if furnished) 2
Mounting 2
Grounding Connection 2
Mounting the Optional Expansion Assembly(s) (if furnished) 2
Mounting 2
Grounding Connection 2
Installing Circuit Cards 2
Circuit Card Handling 3
Identifying the Circuit Cards 3
Installing an Optional Modem Circuit Card 3
Installing the CPU Circuit Card(s) 7
Installing Input/Output (I/O) Circuit Cards 9
Making Electrical Connections 16
Observe the Following Admonishment 16
Wiring Considerations 16
586505000/586505500 Main and Expansion Cabinet Grounding Connection (586505000/586505500 only) 16
586505000/586505500 Main and Expansion Cabinet DC Input Power Connection (586505000/586505500 only) 16
External CPU/Hardware Fail Alarm Connections 26
Local Terminal Port Connections 26
Gateway Port Connections (if Gateway Software Option is installed) 27
Internal Modem Port Connections 27
Ethernet Port Connections (10M) 27
OEM1 Port Connections (if required) (586505000/586505500 Only) 28
OEM2 Port Connections (if required) (586505000/586505500 Only) 28
OEM3 Port Connections (if required) (586505000/586505500 Only) 29
582140000/582140001/582126100 Power System's LMS RS-485 Port Connections (RS-485 Port) 31
LMS1000 Input/Output (I/O) Circuit Card Connections 31
Interconnecting the Optional 586505000/586505500 Expansion Assembly(s) (if furnished) to Customer Equipment 41
Interconnecting the Expansion Cabinet(s) and Assembly(s) (if furnished) into the LMS1000 Network (586505000/586505500 Only) 45

Energy Management Connections (when used w/ 'traditional' rectifiers external to the system) 47
Sequential Start Connections 48
LMS Dual MCA Interface Software Option 49
Powering Up and Checking System Operation 49
Initial Startup Preparation 49
Powering Up the System 49
Logging Onto the System 49
586505000/586505500 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay I/O Circuit Card Verification 49
Software Option Verification 50
Verifying Programmable Status LED Indicator Operation 50
Verifying Relay Operation 50
Logging Off of the System 51
Configuring the System 51
Installation Logs/Worksheets 51
Configuring LMS1000 69
Getting Started 69
Required Password 69
What Can Be Changed 69
Descriptions of Configuration Attributes 70
Unit Identification 70
GET Community String 70
TRAPS Community String 70
SET Community String 70
TRAP Addresses 70
Gateway Address 70
Netmask Address 71
Host Addresses 71
Alarm Classes 71
Program Lines 71
Examples of Various Types of Program Lines 74
Program Line Time Periods 75
Common Channel Attributes 75
Analog Channel Attributes 75
Binary Channel Attributes 77
Function Channel Attributes 78
LED Channel Attributes 78
Relay Channel Attributes 79
User Attributes 80
Groups 82
System Alarm Reporting 82
Initial Configuration 83

Setting Local Port Communications Parameters 83
Setting Gateway Port Parameters (if Gateway Software Option Installed) 83
Setting System Configuration 83
Setting Email Parameters 105
Configuring Groups 105
Setting User Timeout 105
Setting WEB Interface 105
Setting the Battery Discharge Timer Feature (if required) 105
Setting SNMP 105
Setting Energy Management (if Energy Management Software Option Installed) 106
Setting Sequential Start (if Sequential Start Software Option Installed) 107
Setting TL1 (if TL1 Software Option Installed) 110
Configuration Required to Allow Access Door to be Locked and Unlocked Manually via LMS1000 (if 586505000/586505500 List 80 installed) 112
Configuring Battery Thermal Runaway Feature 112
Configuring MCA "CAN I/0" Circuit Cards (if installed in a Spec. No. 582140000, 5821400001, or 582126100 Bay) 113
Configuring Analog Channels for Use with the 130VDC Monitoring Wire Harness 113
LMS Dual MCA Interface Software Option 113
Checking the System Time 113
Checking for Alarms 114
Downloading the Configuration 114
Subsequent Configuration 114
Changing the Date, Time, Unit Name, Unit Number, System Identifier, Unit Header, Unit Pager Code, and Pager Delay 114
Adding and Configuring LMS1000 Expansion Nodes 115
Changing the Analog Channel Configurations 117
Changing the Binary Channel Configurations 123
Changing the Energy Management Channel Configurations 126
Changing the Function Channel Configurations 128
Changing the LED Channel Configurations 133
Changing the Relay Channel Configurations 136
Changing the Number of Rings before Answer 139
Changing the User Configurations 139
Adding or Deleting Channels from the User Configurations 144
Setting Alarm Class Names 145
Changing System Alarm Reporting or Individual User Reports 146
Configuring Channels Into Groups 147
Resetting Defaults 148
NetPerform™ Optimization Services 149

Admonishments Used in this Document

	DANGER! Warns of a hazard the reader ***will*** be exposed to that will ***likely*** result in death or serious injury if not avoided. (ANSI, OSHA)
	WARNING! Warns of a potential hazard the reader ***may*** be exposed to that ***could*** result in death or serious injury if not avoided. This admonition is not used for situations that pose a risk only to equipment, software, data, or service. (ANSI)
	CAUTION! Warns of a potential hazard the reader ***may*** be exposed to that ***could*** result in minor or moderate injury if not avoided. (ANSI, OSHA) This admonition is not used for situations that pose a risk only to equipment, data, or service, even if such use appears to be permitted in some of the applicable standards. (OSHA)
	ALERT! Alerts the reader to an action that ***must be avoided*** in order to protect equipment, software, data, or service. (ISO)
	ALERT! Alerts the reader to an action that ***must be performed*** in order to prevent equipment damage, software corruption, data loss, or service interruption. (ISO)
	FIRE SAFETY! Informs the reader of fire safety information, reminders, precautions, or policies, or of the locations of fire-fighting and fire-safety equipment. (ISO)
	SAFETY! Informs the reader of general safety information, reminders, precautions, or policies not related to a particular source of hazard or to fire safety. (ISO, ANSI, OSHA)

Static Warning

This equipment contains static sensitive components. The warnings listed below must be observed to prevent damage to these components. Disregarding any of these warnings may result in personal injury or damage to the equipment.

1. Strictly adhere to the procedures provided in this document.
2. Before touching any equipment containing static sensitive components, discharge all static electricity from yourself by wearing a wrist strap grounded through a one megohm resistor. Some wrist straps, such as Emerson Network Power Part Number 631810600, have a built-in one megohm resistor; no external resistor is necessary. Read and follow wrist strap manufacturer's instructions outlining use of a specific wrist strap.
3. Do not touch traces or components on equipment containing static sensitive components.
   Handle equipment containing static sensitive components only by the edges that do not have connector pads.
4. After removing equipment containing static sensitive components, place the equipment only on conductive or anti-static material such as conductive foam, conductive plastic, or aluminum foil. Do not use ordinary Styrofoam™ or ordinary plastic.
5. Store and ship equipment containing static sensitive components only in static shielding containers.
6. If necessary to repair equipment containing static sensitive components, wear an appropriately grounded wrist strap, work on a conductive surface, use a grounded soldering iron, and use grounded test equipment.

FCC Information

The MCA Interface Modem Option (if installed) has been granted a registration number by the Federal Communications Commission, under Part 68 rules and regulations for direct connection to the telephone lines. In order to comply with these FCC rules, the following instructions must be carefully read and applicable portions followed completely:

a. Direct connection to the telephone lines may be made only through the standard plug- ended cord furnished to the utility-installed jack. No connection may be made to party or coin phone lines. Prior to connecting the device to the telephone lines, you must:

b. Call your telephone company and inform them you have an FCC registered device you desire to connect to their telephone lines. Give them the number(s) of the line(s) to be used, the make and model of the device, the FCC registration number and ringer equivalence. This information will be found on the device or enclosed with instructions as well as the jack suitable for your device.

c. After the telephone company has been advised of the above you may connect your device if the jack is available, or after the telephone company has made the installation.

d. Repairs may be made only by the manufacturer or his authorized service agency. Unauthorized repairs void registration and warranty. Contact seller or manufacturer for details of permissible user performed routine repairs, and where and how to have other than routine repairs.

e. If, through abnormal circumstances, harm to the telephone lines is caused, it should be unplugged until it can be determined if your device or the telephone line is the source. If your device is the source, it should not be reconnected until necessary repairs are effected.

f. Should the telephone company notify you that your device is causing harm, the device should be unplugged. The telephone company will, where practicable, notify you, that temporary discontinuance of service may be required. However, where prior notice is not practicable, the telephone company may temporarily discontinue service, if such action is reasonably necessary, in such cases the telephone company must (A) Promptly notify you of such temporary discontinuance, (B) Afford you the opportunity to correct the condition and (C) Inform you of your rights to bring a complaint to the FCC under their rules.

g. The telephone company may make changes in its communications facilities, equipment, operations or procedures, where such action is reasonably required in the operation of its business and is not inconsistent with FCC rules. If such changes can be reasonably expected to render any customer's devices incompatible with telephone company facilities, or require modification or alteration, or otherwise materially affect its performance, written notification must be given to the user, to allow uninterrupted service.

The following information is provided here and on a label attached to the outside of the MCA Interface Modem Option (if installed).

JACK	RINGER EQUIVALENCE	FCC REGISTRATION NUMBER
RJ-11	0.2A	B46USA-22429-MM-E

General Information and Installation Checklist

Preface

This document (Section 5879) provides *Installation Instructions* for Monitoring System Model **LMS1000**, Spec. Nos. **586505000** and **586505500**. These instructions also provide procedures for the integrated LMS of Spec. Nos. **582140000**, **582140001**, and **582126100** Power Systems.

For *User Instructions*, refer to Section 5847 provided on the CD (Electronic Documentation Package) furnished with your system.

Refer to SAG586505000/SAG586505500 (System Application Guide) for additional information. The SAG can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Note: *The LMS cabinet (Spec. No. 586505000/586505500) can be used in Vortex® Power Systems (VPS) and NetSure™ Power Systems (NPS). The LMS is also factory integrated (w/out using the Spec. No. 586505000/586505500 cabinet) into Spec. Nos. 582140000, 582140001, and 582126100 NetSure™ Power Systems (NPS). In this document, reference to an LMS in a VPS or NPS using the Spec. No. 586505000/586505500 cabinet will be VPS/NPS (LMS commands and responses specific to this interface use 'NETSURE'). Reference to an LMS in a Spec. No. 582140000, 582140001, and 582126100 NPS Power System will be NPS (LMS commands and responses specific to this interface use 'NPS').*

Installation Acceptance Checklist

Provided below is an Installation Acceptance Checklist. This checklist helps ensure proper installation and initial operation of the system. As the procedures presented in this document are completed, check the appropriate box on this list. If the procedure is not required to be performed for your installation site, also check the box in this list to indicate that the procedure was read. When installation is done, ensure that each block in this list has been checked.

Note: *The system is not powered up until the end of this checklist.*

Note: *Some of these procedures may have been performed at the factory for you.*

Installing LMS1000

- ❑ LMS1000 Display Option Installed **(586505000/586505500 only)**
- ❑ Main Cabinet and Expansion Cabinet(s) Mounted in a Relay Rack **(586505000/586505500 only)**
- ❑ Optional Expansion Assembly(s) Mounted in Customer Equipment
- ❑ Optional Modem Circuit Card Installed
- ❑ CPU Circuit Card(s) Installed
- ❑ Four Input Analog Circuit Card Installed after Making any Jumper Adjustment as Required
- ❑ Eight Input Analog Circuit Card Installed
- ❑ Twelve Input Analog Circuit Card Installed
- ❑ Four Input Binary Circuit Card Installed
- ❑ Eight Input Binary Circuit Card Installed after Making any Jumper Adjustment as Required
- ❑ Four Output (Form-C) Relay Circuit Card Installed after Making any Jumper Adjustment as Required
- ❑ Eight Input Temperature Circuit Card Installed and Ground Lead Attached to Frame Ground
- ❑ Main and Expansion Cabinets Grounding Connection Made **(586505000/586505500 only)**
- ❑ Main and Expansion Cabinets DC Input Power Connection Made **(586505000/586505500 only)**
- ❑ External CPU/Hardware Fail Alarm Connections Made
- ❑ Local Port Connections Made
- ❑ Modem Port Connections Made
- ❑ Ethernet Port Connections Made
- ❑ OEM1 Port Connections Made **(586505000/586505500 only)**
- ❑ OEM2 Port Connections Made **(586505000/586505500 only)**
- ❑ OEM3 (VPS/NPS) Port Connections Made **(586505000/586505500 only)**
- ❑ Gateway Port (if available) Connections Made
- ❑ Connections Made to all Four Input Analog Circuit Cards Installed
- ❑ Connections Made to all Eight Input Analog Circuit Cards Installed
- ❑ Connections Made to all Twelve Input Analog Circuit Cards Installed
- ❑ Connections Made to all Four Input Binary Circuit Cards Installed

- ❑ Connections Made to all Eight Input Binary Circuit Cards Installed
- ❑ Connections Made to all Four Output (Form-C) Relay Circuit Cards Installed
- ❑ Connections Made to all Eight Input Temperature Circuit Cards Installed
- ❑ Optional Expansion Assembly(s) (if furnished) Interconnected to Customer Equipment
- ❑ All 586505000/586505500 Expansion Cabinets, 582140000/582140001/582126100 Secondary Bays, and/or 586505000/586505500 Expansion Assemblies (if furnished) Interconnected into LMS1000 Network
- ❑ Energy Management Connections Made, if required
- ❑ Sequential Start Connections Made, if required
- ❑ System Powered Up and Checked

Configuring LMS1000

- ❑ System Configured

Installing LMS1000

Installing the LMS1000 Display Option

Refer to Section 5942 or Section 5943 to field install an LMS1000 Display option. These are provided in the LMS1000 Installation Manual, and on the CD provided with your system documentation. The option is factory installed if ordered with the system.

Mounting the 586505000/586505500 Main Cabinet and Expansion Cabinet(s) (if furnished)

The installer should be familiar with the installation requirements and technique to be used in mounting the cabinet(s).

Note that Spec. Nos. 582140000, 582140001, and 582126100 Power Systems do not use the LMS1000 Cabinets. The LMS is factory integrated into the Power Systems.

Mounting

The cabinet(s) is to be mounted in a relay rack with 1 or 1-3/4 inch multiple drilling.

586505000 Lists 1 and 6: The cabinet(s) is provided with reversible mounting angles to allow mounting in a 19 inch or 23 inch wide relay rack. The mounting angles may also be positioned for flush front mounting, 5-inch front projection mounting, or 6-inch front projection mounting. If necessary, remove and reposition the reversible mounting angles to meet your requirements.

586505000 and 586505500 Lists 2 and 7: The cabinet(s) is to be mounted in a 23 inch wide relay rack. The mounting angles may also be positioned for flush front mounting, 5-inch front projection mounting, or 6-inch front projection mounting. If necessary, remove and reposition the reversible mounting angles to meet your requirements.

Note: *A removable label is provided on the front panel of the Main Cabinet. This allows the user to write the functions of the programmable LEDs, if desired.*

Grounding Connection

Main and Expansion Cabinets: The earth ground connection to the cabinet is made via an external connection brought to the outside of the cabinet. Refer to "MAKING ELECTRICAL CONNECTIONS" in this section for details.

Relay Rack: Refer to the National Electrical Code, applicable local codes, and your specific site requirements.

Mounting the Optional Expansion Assembly(s) (if furnished)

The installer should be familiar with the installation requirements and technique to be used in mounting the assembly(s).

Mounting

The assembly(s) is to be mounted in customer equipment, as required.

The assembly(s) is provided with a back sheetmetal panel with mounting holes. Mount the assembly to a suitable surface. Refer to SAG586505000/SAG586505500 for mounting hole dimensions. The SAG can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Grounding Connection

The earth ground connection to the assembly(s) is to be made with the hardware used to mount to assembly(s). This requires the use of a ground washer with the assembly(s) mounting hardware. A ground washer is an internal-external tooth, dish-type lock washer.

Installing Circuit Cards

Circuit cards may have been factory installed for you. The 586505000/586505500 cabinet(s) should be unpacked and mounted prior to unpacking and installing the circuit cards. Note that Spec. Nos. 582140000, 582140001, and 582126100 Power Systems do not use the LMS1000 Cabinets. The LMS is factory integrated into the Power Systems.

Circuit Card Handling

WARNING! Before handling any circuit card, read and follow the instructions contained on the Static Warning Page located at the beginning of this document.

A static wrist strap grounded through a one megohm resistor should always be worn when handling the circuit cards.

Identifying the Circuit Cards

Each circuit card associated with the system is shipped in a separate package. These circuit cards can be identified through two methods as described below.

a. the Emerson Network Power part number printed on the outside of the shipping carton

b. the Emerson Network Power part number silkscreened on the component side of the circuit card

Installing an Optional Modem Circuit Card

The optional modem circuit card plugs onto the top of the LMS1000 CPU circuit card installed in the 586505000/586505500 LMS1000 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay.

PROCEDURE:

Note: *Refer to Figure 1 as this procedure is performed.*

1. Connect an approved grounding strap to your wrist. Attach the other end to a suitable ground.
2. Unpack the Modem circuit card (P/N 508951).
3. **586505000/586505500 LMS1000 Main Cabinet:** If the CPU circuit card is not already installed in the Main Cabinet, unpack the CPU circuit card (P/N 514024). If the CPU circuit card is already installed, rotate the two captive fasteners on the front of the Main Cabinet until the arrow on the fastener points up or down, and pivot the door open. Remove the CPU circuit card.
   or
   582140000/582140001/582126100 Power System: If the CPU circuit card is not already installed in the Primary Power Bay, unpack the CPU circuit card (P/N 521185). If the CPU circuit card is already installed, remove the LMS CPU circuit card from the Primary Power Bay.
4. The modem circuit card connects to the CPU circuit card via a connector that contains a set of pins that plug into a mating connector on the CPU circuit card. The modem circuit card is secured to the CPU circuit card via three supplied plastic standoffs that snap into holes located on the modem circuit card and corresponding holes in the CPU circuit card. The modem circuit card is also secured and grounded through the CPU circuit card via a metal standoff located on the modem circuit card and a supplied screw.

   Before performing the next steps, study the diagram in Figure 1. Locate the mating connectors on the modem and CPU circuit cards. Locate the mounting holes for the plastic standoffs on the modem circuit card and the corresponding holes on the CPU circuit card.
5. Refer to Figure 1, and snap the three supplied plastic standoffs into the holes provided on the modem circuit card. Ensure the standoffs protrude towards the component side of the circuit card.
6. Hold the modem circuit card by the edges. Orient the circuit card as shown in Figure 1. Align the mating connectors on the modem and CPU circuit cards, and the standoffs on the modem circuit card with the corresponding holes on the CPU circuit card. Push the modem circuit card down onto the CPU circuit card, ensuring the mating connectors are properly aligned, until all three plastic standoffs snap into holes on the CPU circuit card.
7. Refer to Figure 1 and secure the grounding screw into the proper mounting hole on the CPU circuit card (from the bottom of the CPU circuit card). This screw secures the CPU circuit card to the metal standoff located on the modem circuit card.
8. **582140000/582140001/582126100 Power System Only:** Install the supplied sheetmetal bracket as shown in Figure 1. Secure with the supplied flathead screw.
9. Install the CPU circuit card into the cabinet or bay as described in the next procedure.
10. When all circuit cards have been installed, remove the grounding wrist strap.
11. After all electrical connections are made (as described later), close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet). In a 582140000/582140001/582126100 Power System, close the bay's front door.
12. **586505000/586505500 LMS1000 Main Cabinet:** Attach the supplied self-adhesive FCC label to the outside rear panel of the cabinet near the phone jack.
    or
    582140000/582140001/582126100 Power System: Attach the supplied self-adhesive FCC label to the sheetmetal located at the bottom of the LMS CPU circuit card housing (near the phone connector on the Modem).

Figure 1. Installing the Modem Circuit Card (cont'd on next page)

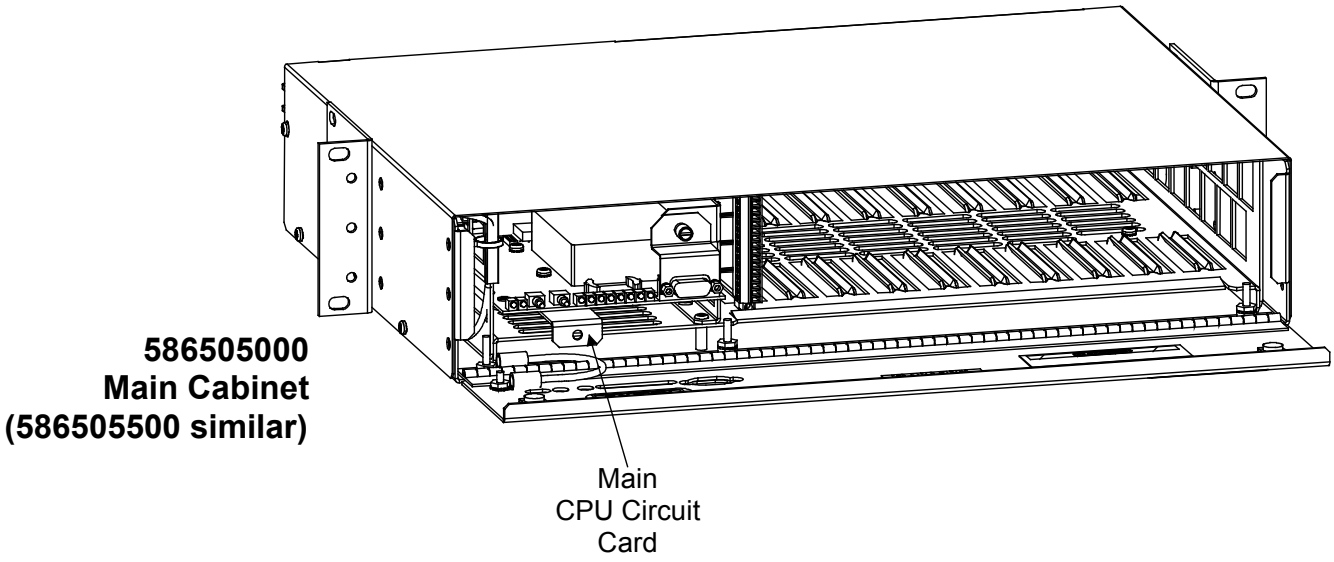


Figure 1. Installing the Modem Circuit Card (cont'd from previous page, cont'd on next page)

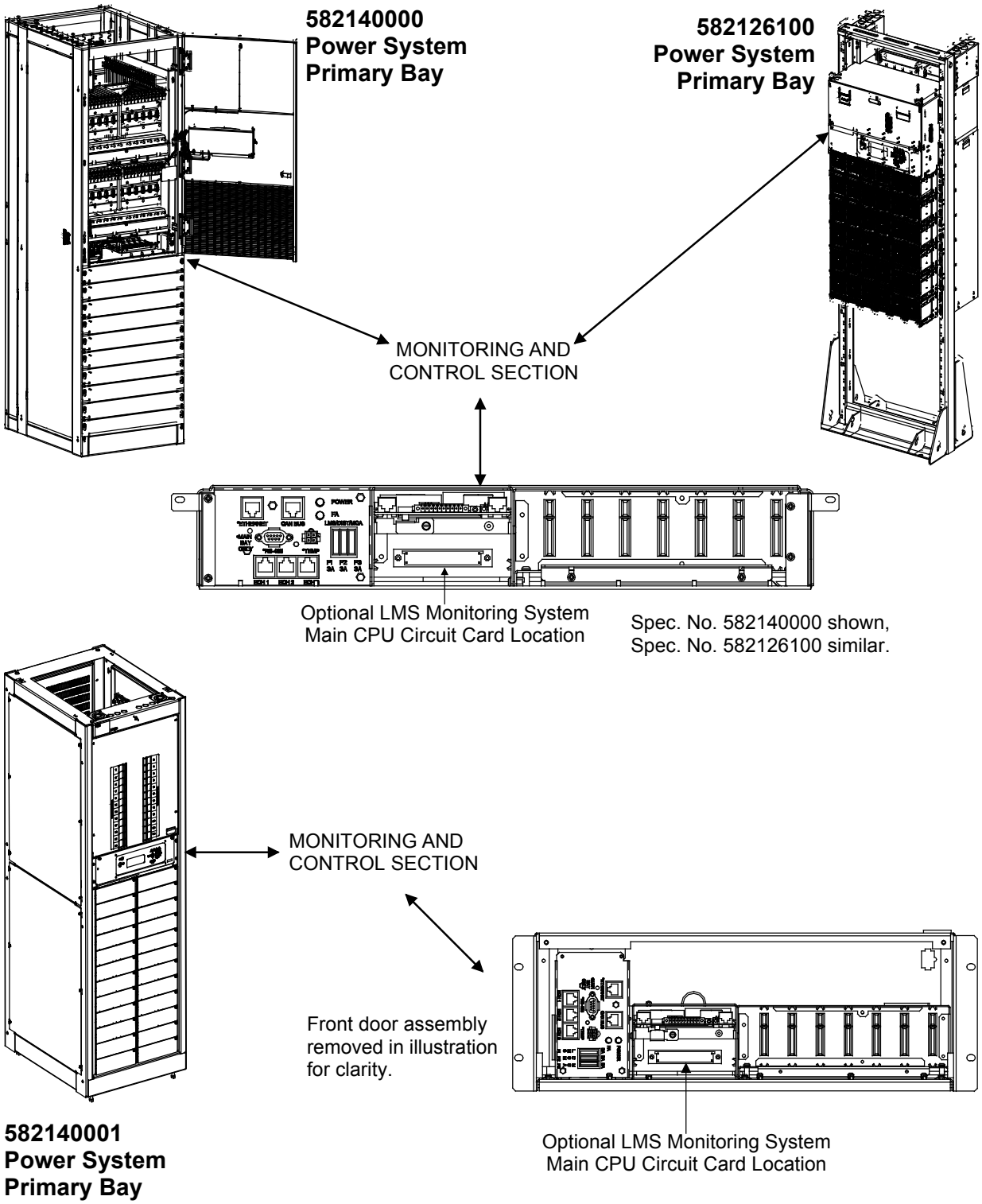
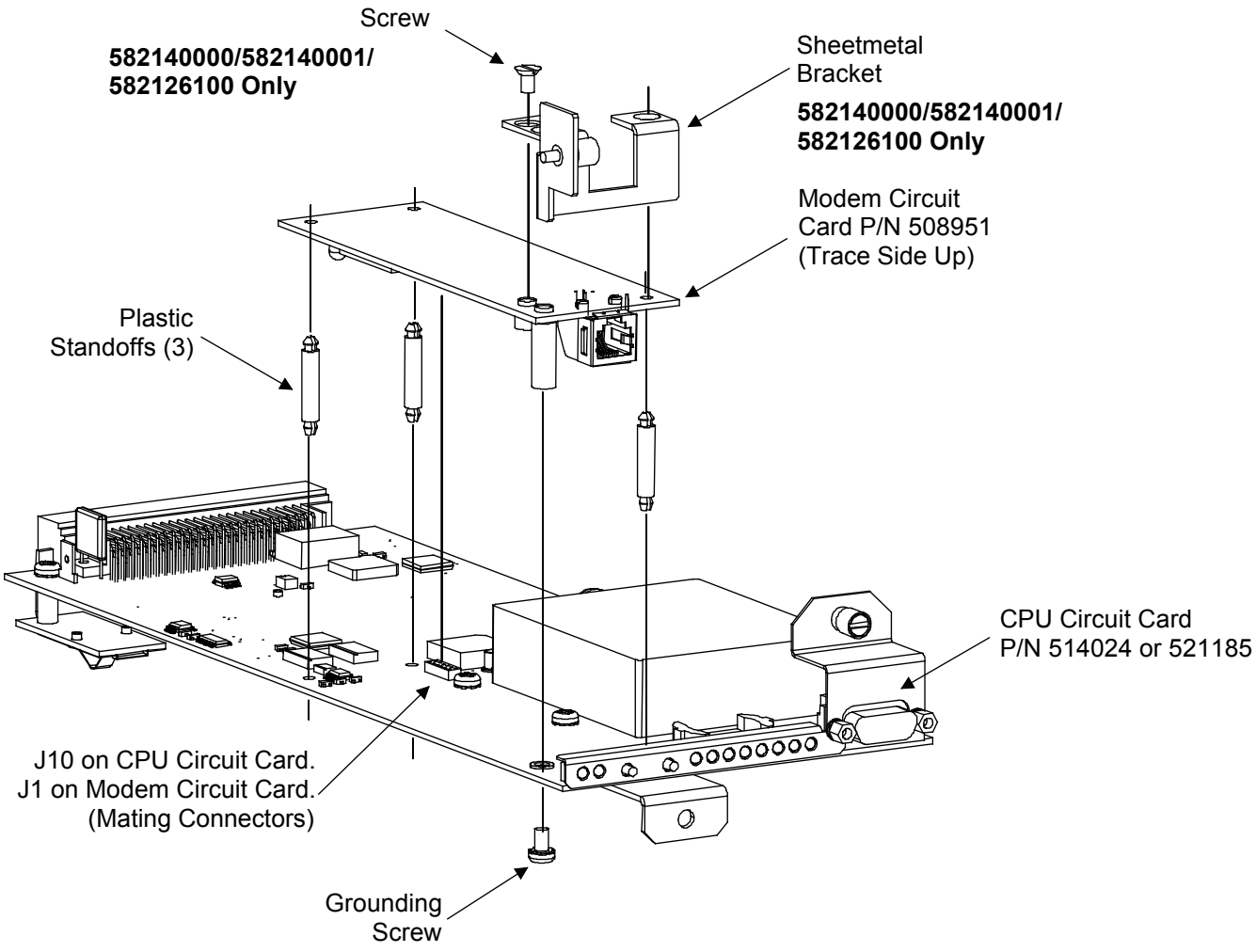
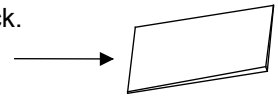


Figure 1. Installing the Modem Circuit Card (cont'd from previous page)



586505000/586505500 Main Cabinet:	Attach supplied FCC label to rear panel near phone jack.
582140000/582140001/ 582126100 Primary Bay:	Attach supplied FCC label to the sheetmetal located at the bottom of the CPU circuit card housing.



Installing the CPU Circuit Card(s)

Refer to the following procedure, and install the CPU circuit card(s) into the respective mounting position of the 586505000/586505500 LMS1000 Main and Expansion Cabinet(s) or 582140000/582140001/582126100 Power System Primary and Secondary Power Bays.

PROCEDURE:

Note: *Refer to Figure 2 as this procedure is performed.*

1. **586505000/586505500 LMS1000 Cabinet:** To access the circuit card mounting position, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100 Power System: Open the bay's front door to access the CPU circuit card mounting positions.
2. Connect an approved grounding strap to your wrist. Attach the other end to a suitable ground.
3. Unpack the CPU circuit card. CPU circuit card P/N 514024 is to be installed in the 586505000/586505500 LMS1000 Main Cabinet. CPU circuit card P/N 521185 is to be installed in the 582140000/582140001/582126100 Primary Power Bay. CPU circuit card P/N 506153 is to be installed in the 586505000/586505500 LMS1000 Expansion Cabinet(s) or 582140000/582140001/582126100 Secondary Bay(s).
4. Slide the CPU circuit card into its mounting location, ensuring the rear edge connector is firmly seated.
5. Secure the circuit card by tightening the retaining screw located on the circuit card assembly (for the Main CPU card, this is also the RS-232 Connector Grounding Screw). In a 582140000/582140001/582126100 Power System, note that if a modem is installed, it also contains a bracket with a retaining screw.
6. When all circuit cards have been installed, remove the grounding wrist strap.
7. After all electrical connections are made (as described later), close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet). In a 582140000/582140001/582126100 Power System, close the bay's front door.
8. Save several of the static protective bags that the circuit cards were shipped in. If a circuit card is ever required to be removed from the system, it should immediately be placed in a static protective bag.

Figure 2. Installing the CPU Circuit Card (Main Cabinet shown, Expansion Cabinet similar) (cont'd on next page)

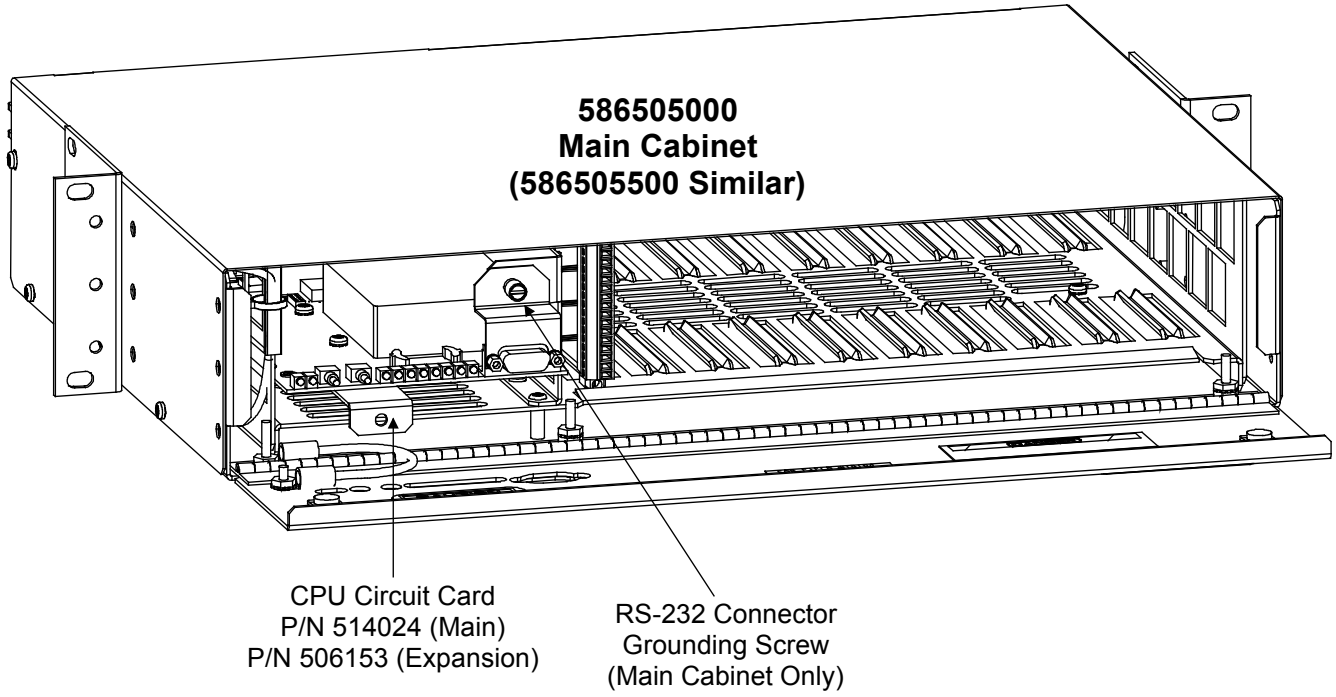
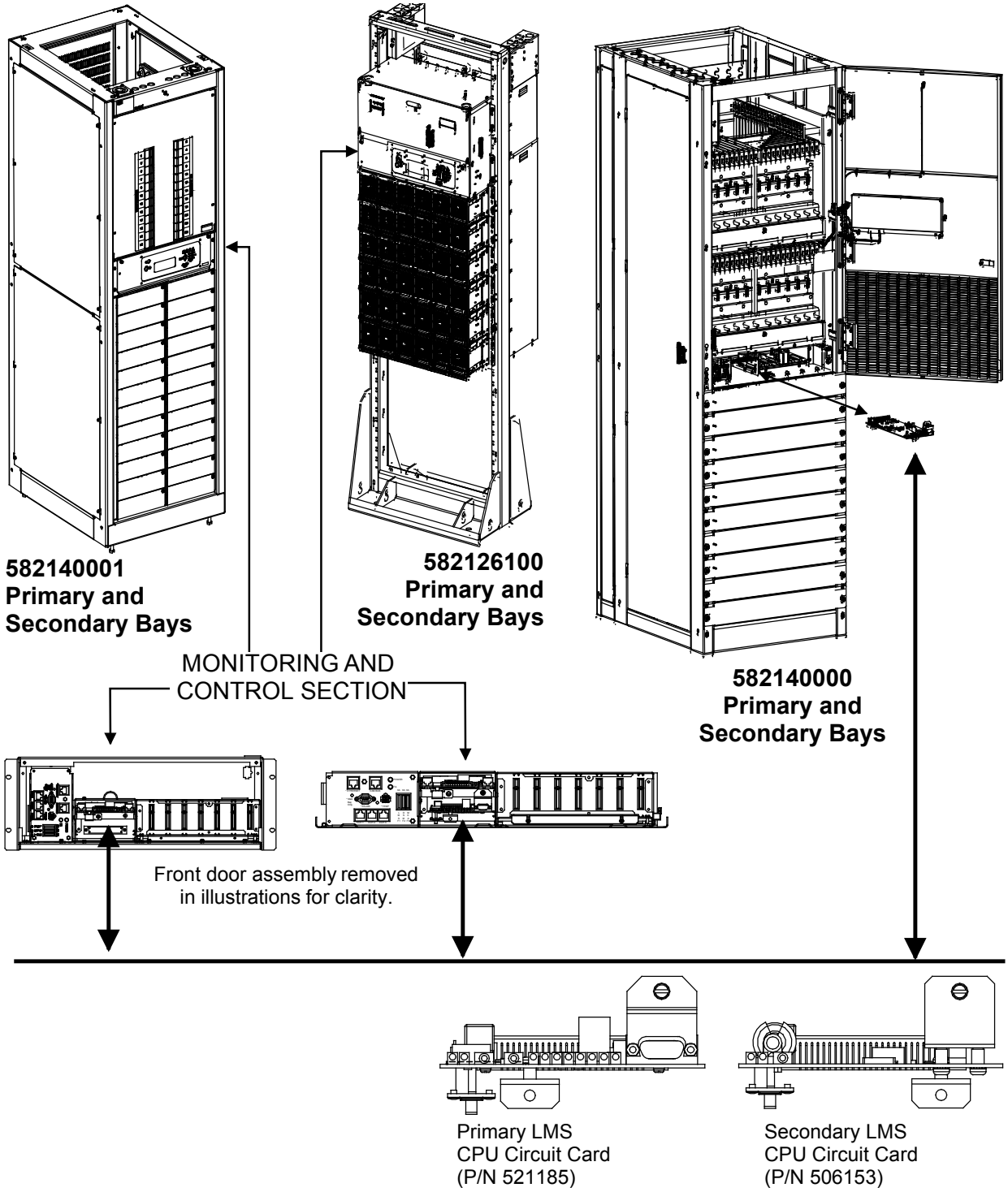


Figure 2. Installing the CPU Circuit Card (Primary Power Bay shown, Secondary Power Bay similar) (cont'd from previous page)



Installing Input/Output (I/O) Circuit Cards

Refer to the following procedure, and install the I/O circuit card(s) into the respective mounting positions of the 586505000/586505500 LMS1000 Main and Expansion Cabinet(s) or 582140000/582140001/582126100 Power System Primary and Secondary Power Bay(s), as required.

Note that in 582140000, 582140001, and 582126100 Power Systems, an LMS CPU circuit card must be installed in a bay that is to be populated with LMS I/O circuit card(s). LMS I/O circuit card mounting positions are provided inside the 582140000/582140001/582126100 bays.

PROCEDURE:

Note: *Refer to Figure 3 through Figure 6 as this procedure is performed.*

1. **586505000/586505500 LMS1000 Cabinet:** To access the circuit card mounting position, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100 Power System: Open the bay's front door to access the CPU circuit card mounting positions.
2. Connect an approved grounding strap to your wrist. Attach the other end to a suitable ground.
3. **582140000/582140001/582126100 Power System:** Loosen the two screws securing the circuit card retaining angle, and slide the retaining angle down.
4. Unpack the LMS1000 I/O circuit card(s) to be installed.

   Four (4) Input Analog Circuit Card (P/N 506336)
   Eight (8) Input Analog Circuit Card (P/N 514528)
   Twelve (12) Input Analog Circuit Card (P/N 520838)
   Eight (8) Input Temperature Circuit Card (P/N 506333)
   Four (4) Input Binary Circuit Card (P/N 506332)
   Eight (8) Input Binary Circuit Card (P/N 506334)
   Four (4) Output Form-C Relay Circuit Card (P/N 506335)

   Note: *A maximum of six 12-input analog circuit cards can be installed in the 586505000/586505500 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay. DO NOT install 12-input analog circuit cards in 586505000/586505500 Expansion Cabinets or 582140000/582140001/582126100 Secondary Bays.*
5. If you are installing a four input analog circuit card, make the following jumper adjustments.
   a. Four jumpers are provided on the four input analog circuit card. Each jumper is associated to an input and sets the input to either monitor 50 mv and 100 mv DC shunt inputs, 0-60 volt DC inputs, or 20 ma current loop inputs. Refer to Figure 4, and set each jumper for the type of input to be monitored.
6. If you are installing an eight input binary circuit card, make the following jumper adjustments.
   a. Eight jumpers are provided on the eight input binary circuit card. Each jumper is associated to an input. The second connection point for each binary input is determined by the placement of the appropriate jumper. These jumpers are factory set to the "-BAT" position. For each binary input, refer to Figure 5 and place the appropriate jumper either in the "+BAT" or "-BAT" connection position. Refer to "Eight Input Binary Circuit Card Connections, P/N 506334" in this section for a description of the connection made by the placement of these jumpers.
7. If you are installing a four output (Form-C) relay circuit card, make the following jumper adjustment.
   a. A jumper is provided on the four output (Form-C) relay circuit card. The placement of this jumper enables or disables the commands SET RLY (Set Relay) and CLR RLY (Clear Relay). Refer to Figure 6 and set this jumper per site requirements.
8. Each I/O circuit card can be installed in any of the circuit card mounting positions in any cabinet or bay, but install circuit cards from left to right, in the next available empty mounting position (as viewed from the front of the cabinet or bay). DO NOT SKIP SLOTS. Circuit cards are installed in the cabinet or bay with the component side facing the left as viewed from the front. Slide the circuit card(s) into its mounting location, ensuring the rear edge connector is firmly seated.

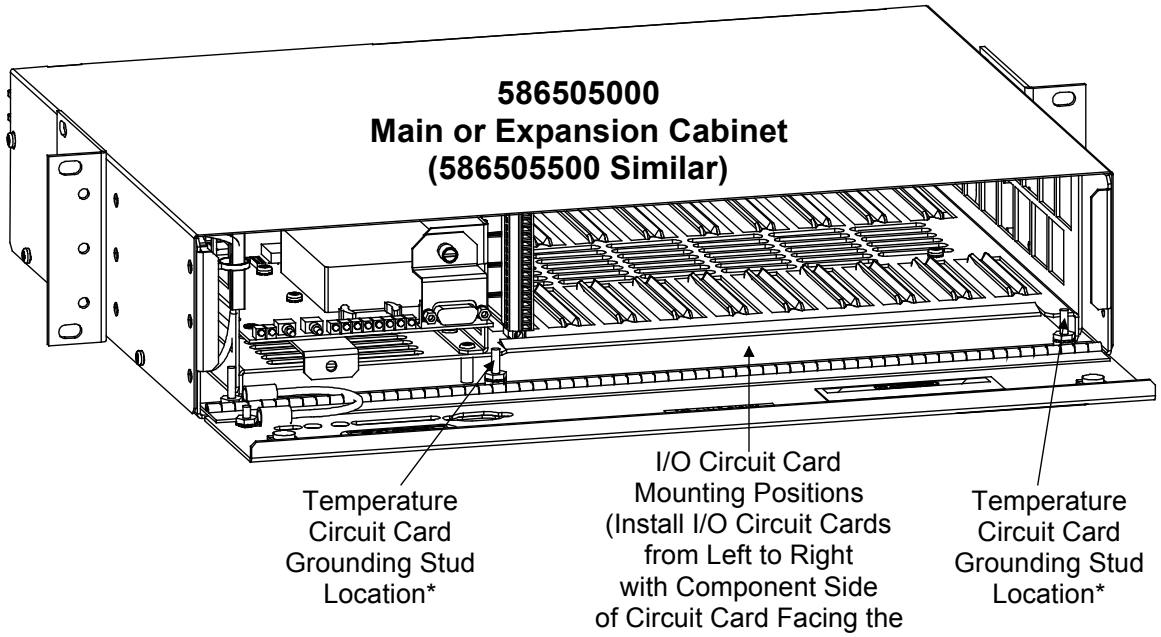
   Note: *In 582140000/582140001/582126100 Power Systems, the recommended method is to populate LMS Input/Output circuit cards from left to right, and MCA Customer Alarm Relay circuit cards from right to left.*
9. **586505000/586505500 LMS1000 Cabinet:** If a temperature circuit card(s) has been installed, attach the green wire connected to the circuit card(s) to one of the grounding studs provided inside the cabinet. Refer to Figure 3 for location. Place the lug of the green wire below the flat washer provided on the grounding stud. Replace the lock washer and resecure the nut.

   582140000/582140001/582126100 Power System: If a Temperature circuit card(s) has been installed, attach the green wire connected to the circuit card(s) to one of the

grounding studs provided inside the bay. Refer to Figure 3 for location. Place the lug of the green wire below the bottom nut. Tighten the top nut down to lock the bottom nut.

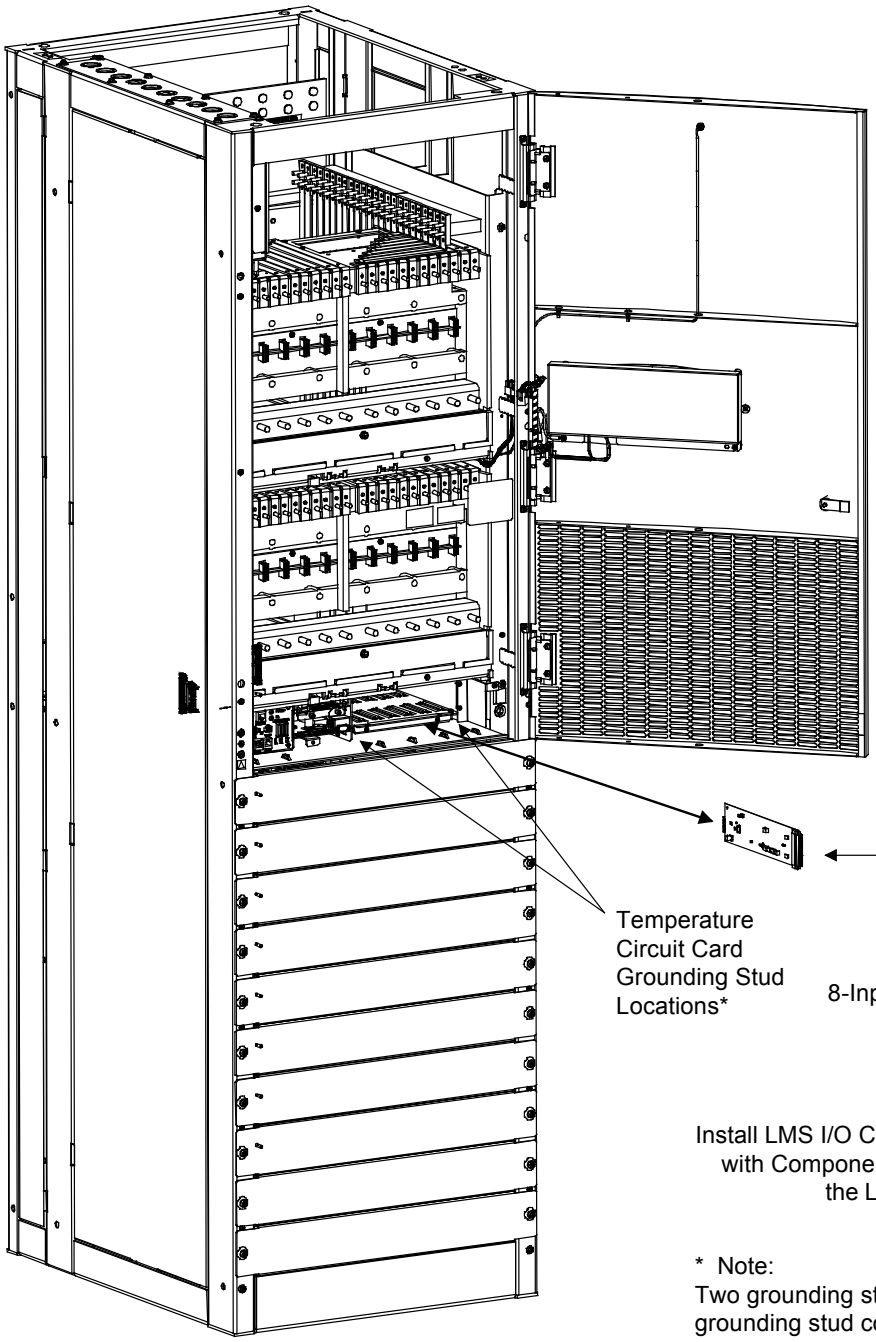
10. Supplied with your system documentation is an I/O circuit card label sheet (P/N 520538). These labels allow circuit card identification without removing a circuit card. Apply the appropriate labels to the sheetmetal below each installed I/O circuit card.
11. **582140000/582140001/582126100 Power System:** When all circuit cards have been installed, slide the circuit card retaining angle up and secure by tightening the two screws.
12. When all circuit cards have been installed, remove the grounding wrist strap.
13. After all electrical connections are made (as described later), close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet). In a 582140000/582140001/582126100 Power System, close the bay's front door.
14. Save several of the static protective bags that the circuit cards were shipped in. If a circuit card is ever required to be removed from the system, it should immediately be placed in a static protective bag.

Figure 3. Installing the I/O Circuit Cards (cont'd on next page)


586505000
Main or Expansion Cabinet
(586505500 Similar)
Temperature Circuit Card Grounding Stud Location*
I/O Circuit Card Mounting Positions (Install I/O Circuit Cards from Left to Right with Component Side of Circuit Card Facing the Left as Viewed from the Front. DO NOT SKIP SLOTS.)
Temperature Circuit Card Grounding Stud Location*

* Note:
Two Grounding Studs are Provided. Each Grounding Stud Contains a Flat Washer, Lock Washer, and Nut. If a Temperature Circuit Card is Installed, Attach the Green Wire from the Circuit Card to One of the Grounding Studs below the Flat Washer. Replace the Lock Washer and Resecure the Nut.

Figure 3. Installing the I/O Circuit Cards (cont'd from previous page, cont'd on next page)



582140000
Power System

LMS Input/Output
(I/O) Circuit Card

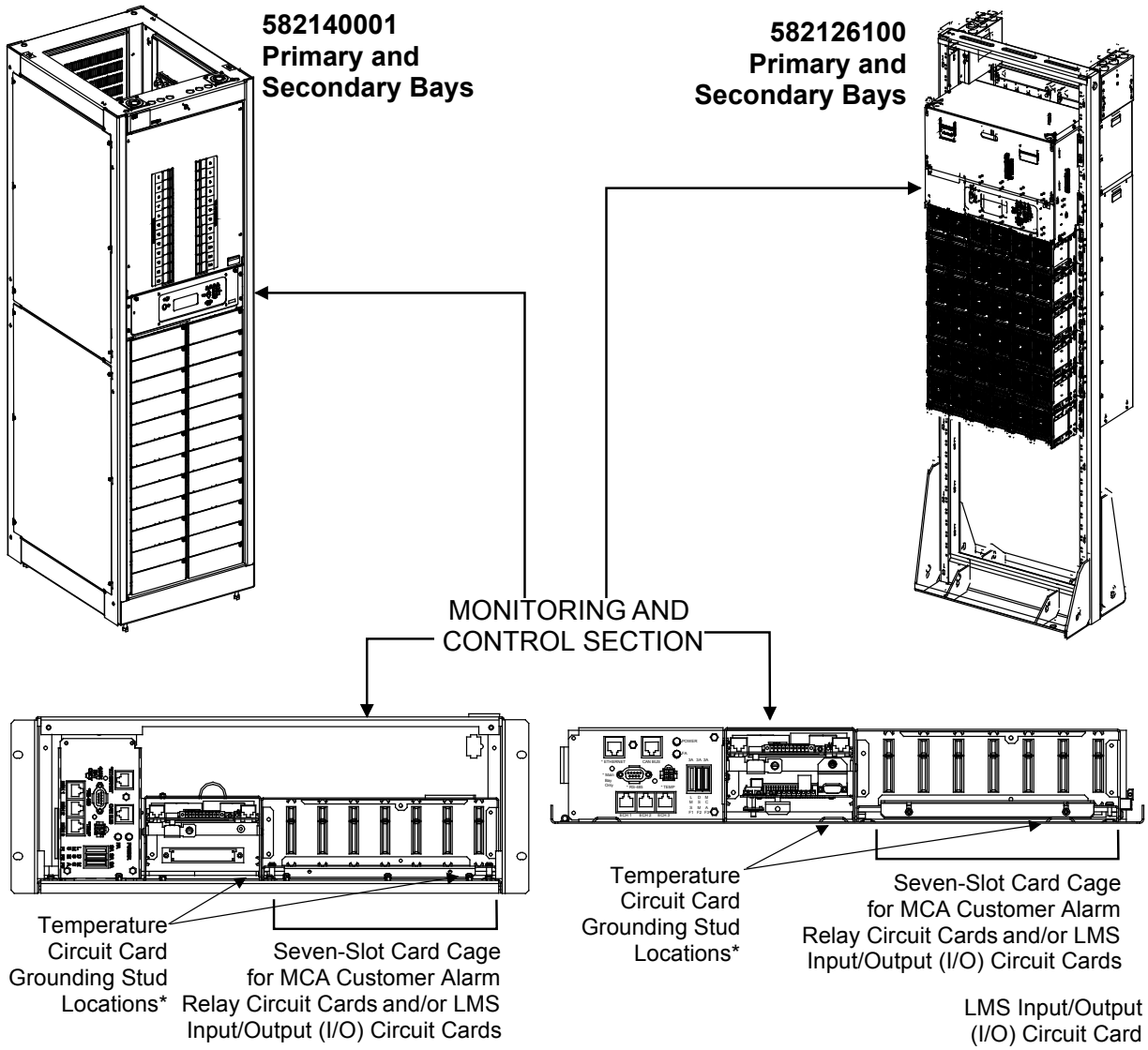
Temperature
Circuit Card
Grounding Stud
Locations*

4-Input Analog, P/N 506336
8-Input Analog, P/N 514528
12-Input Analog, P/N 520838
8-Input Temperature, P/N 506333
4-Input Binary, P/N 506332
8-Input Binary, P/N 506334
4-Output Relay, P/N 506335

Install LMS I/O Circuit Cards from Left to Right with Component Side of Circuit Card Facing the Left as Viewed from the Front. DO NOT SKIP SLOTS.

* Note:
Two grounding studs are provided. Each grounding stud contains two nuts. If a Temperature circuit card is installed, attach the Green Wire from the circuit card to one of the grounding studs, below the bottom nut. Tighten the top nut down to lock the bottom nut.

Figure 3. Installing the I/O Circuit Cards (cont'd from previous page)



LMS Input/Output
(I/O) Circuit Card

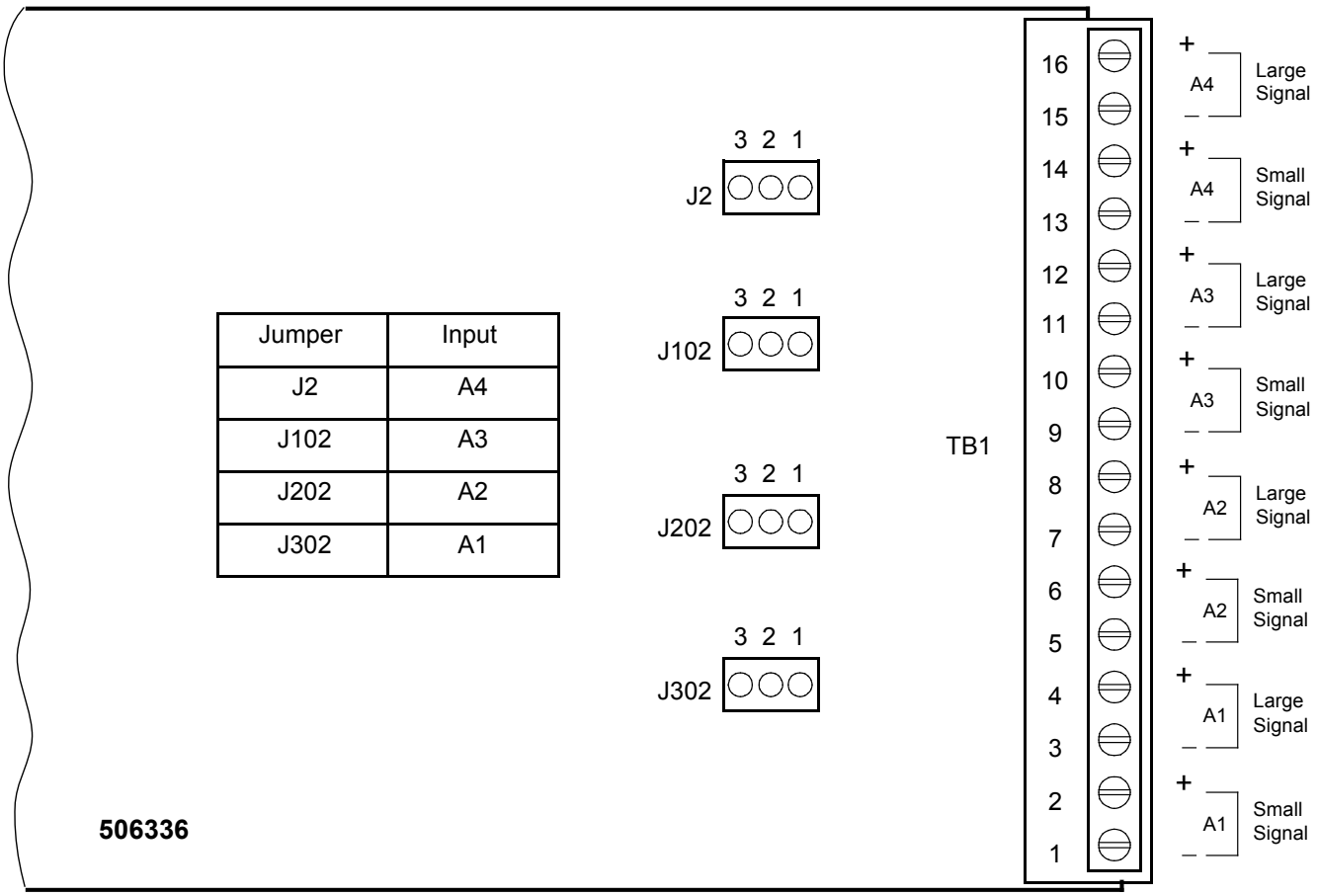
4-Input Analog, P/N 506336
8-Input Analog, P/N 514528
12-Input Analog, P/N 520838
8-Input Temperature, P/N 506333
4-Input Binary, P/N 506332
8-Input Binary, P/N 506334
4-Output Relay, P/N 506335

Front door assembly removed
in illustrations for clarity.

Install LMS I/O Circuit Cards from Left to Right
with Component Side of Circuit Card Facing
the Left as Viewed from the Front.
DO NOT SKIP SLOTS.

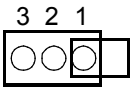
* Note:
Two grounding studs are provided. Each grounding stud contains two nuts. If a Temperature circuit card is installed, attach the Green Wire from the circuit card to one of the grounding studs, below the bottom nut. Tighten the top nut down to lock the bottom nut.

Figure 4. Jumper Location, Four Input Analog Circuit Card, P/N 506336

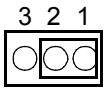


Jumper	Input
J2	A4
J102	A3
J202	A2
J302	A1

Place jumper ONLY on pin 1 for 50 mv and 100 mv shunt inputs.
Connect inputs to terminals designated "Small Signal".



Place jumper on pins 1 and 2 for 0-60 volt DC inputs.
Connect inputs to terminals designated "Large Signal".



Place jumper on pins 2 and 3 for 20 ma current loop inputs.
Connect inputs to terminals designated "Small Signal".

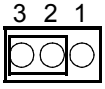
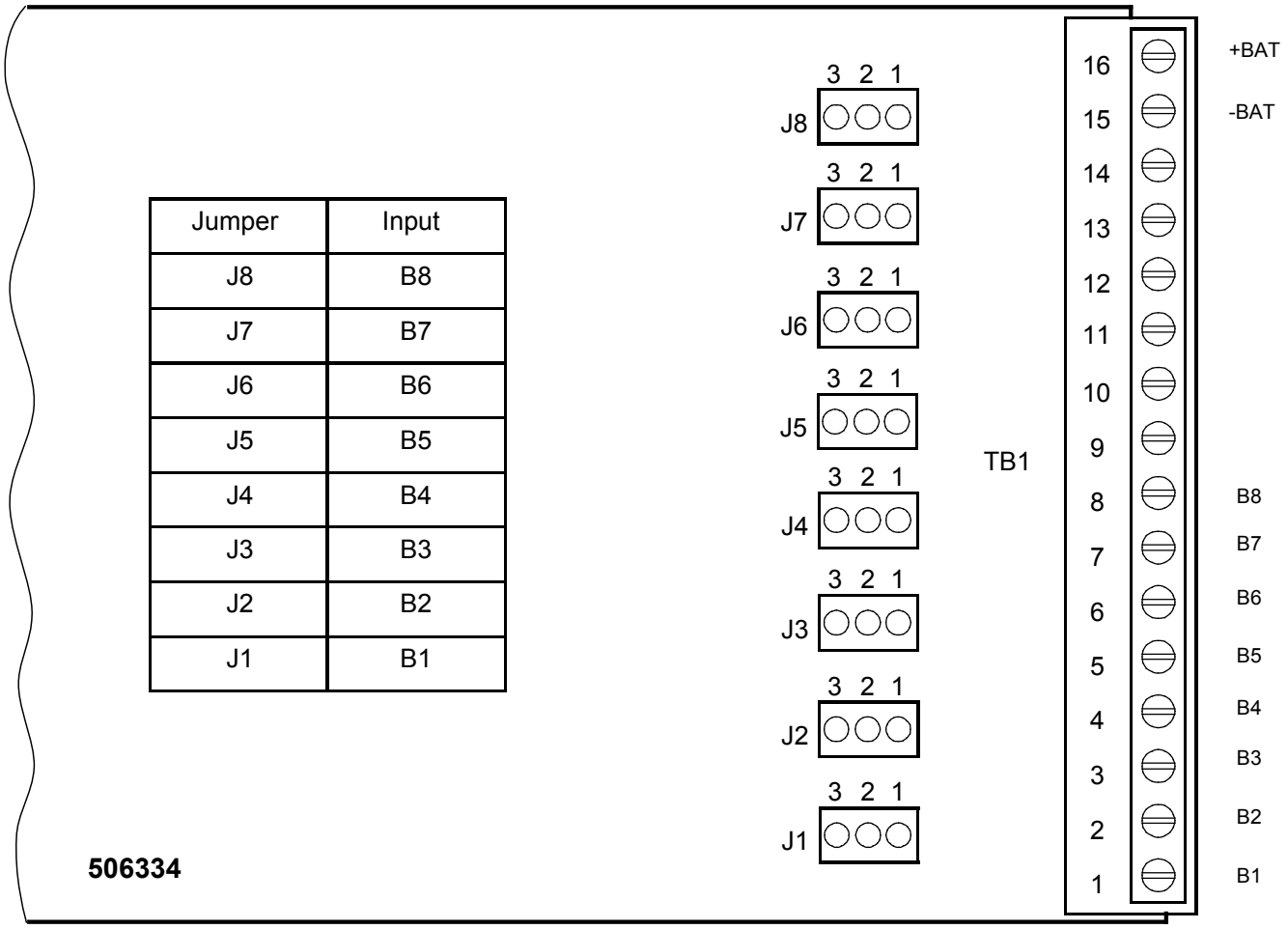
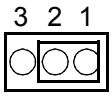


Figure 5. Jumper Location, Eight Input Binary Circuit Card, P/N 506334



Jumper	Input
J8	B8
J7	B7
J6	B6
J5	B5
J4	B4
J3	B3
J2	B2
J1	B1

Place jumper on pins 1 and 2 to complete a -BAT connection for this input



Place jumper on pins 2 and 3 to complete a +BAT connection for this input

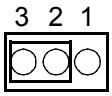
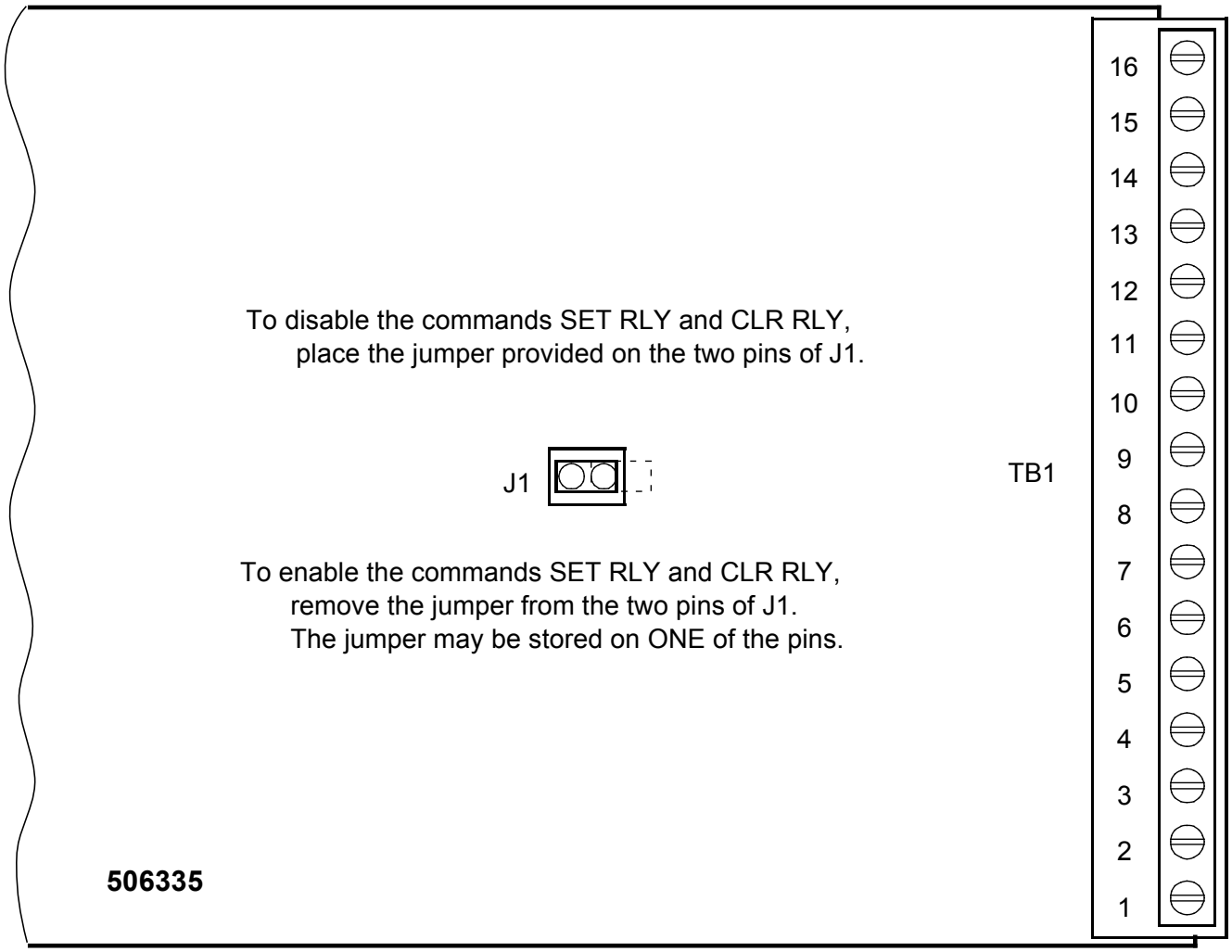


Figure 6. Jumper Location, Four Output (Form-C) Relay Circuit Card, P/N 506335



Making Electrical Connections

All electrical connections are made without DC input power applied to the system.

Observe the Following Admonishment

DANGER! This product requires Safety Extra-Low Voltage (SELV) Inputs. A SELV input (based on the safety requirements for Information Technology Equipment Standards, such as UL1950, IEC 950) is a secondary circuit which is so designed and protected that under normal and single-fault conditions, the voltage between any two paths of the SELV circuit or circuits and for Class 1 equipment (provided with a protective earthing conductor from the building), between any one such part and the equipment protective earthing terminal does not exceed a safe value (42.4 V peak or 60 Vdc under normal conditions). It is separated from the primary or mains supply by Double (insulation comprising both Basic and Supplementary insulation) or Reinforced insulation (a single insulation system which provides a degree of protection against electric shock equivalent to Double insulation).

DANGER! DO NOT apply power to the system until all electrical connections have been completed and checked.

DANGER! To minimize voltage potentials inside the cabinet during installation, connect leads to the cabinet first, before connecting leads to the external source.

Wiring Considerations

All wiring and branch circuit protection should follow the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NPFA) National Electrical Code (NEC), and applicable local codes. For operation in countries where the NEC is not recognized, follow applicable codes. For field wiring, use wires suitable for at least 75°C.

586505000/586505500 Main and Expansion Cabinet Grounding Connection (586505000/586505500 only)

A frame ground stud is provided on the rear of the cabinet. Refer to Figure 7 for location. Recommended wire size is 14 gauge. Recommended torque is 23 in-lbs. Provide a grounding connection to this stud.

586505000/586505500 Main and Expansion Cabinet DC Input Power Connection (586505000/586505500 only)

DC input power connections are made to the two-position terminal block located on the rear of the cabinet. Connections should be made using 18 gauge or 16 gauge stranded wire. The ungrounded input lead should be fused at 3 amperes.

Refer to Figure 7 for DC input power terminal block location and identification. The DC input power terminal block accepts a wire size in the range of 22 to 14 gauge. Recommended torque is 12 in-lbs.

Connect the positive DC input lead to the terminal designated + (positive).

Connect the negative DC input lead to the terminal designated - (negative).

Figure 7. ***586505000/586505500*** *Terminal Location and Identification (cont'd on next page)*

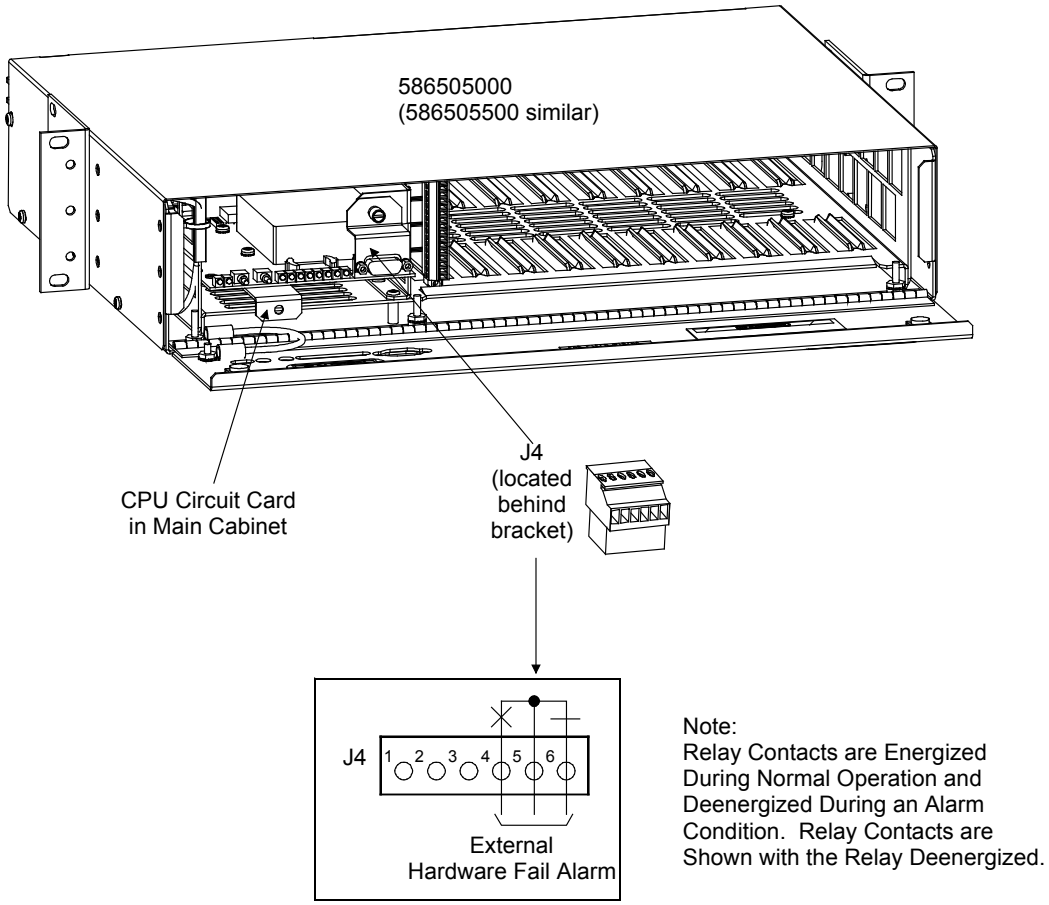


Figure 7. ***586505000/586505500*** *Terminal Location and Identification (cont'd from previous page, cont'd on next page)*

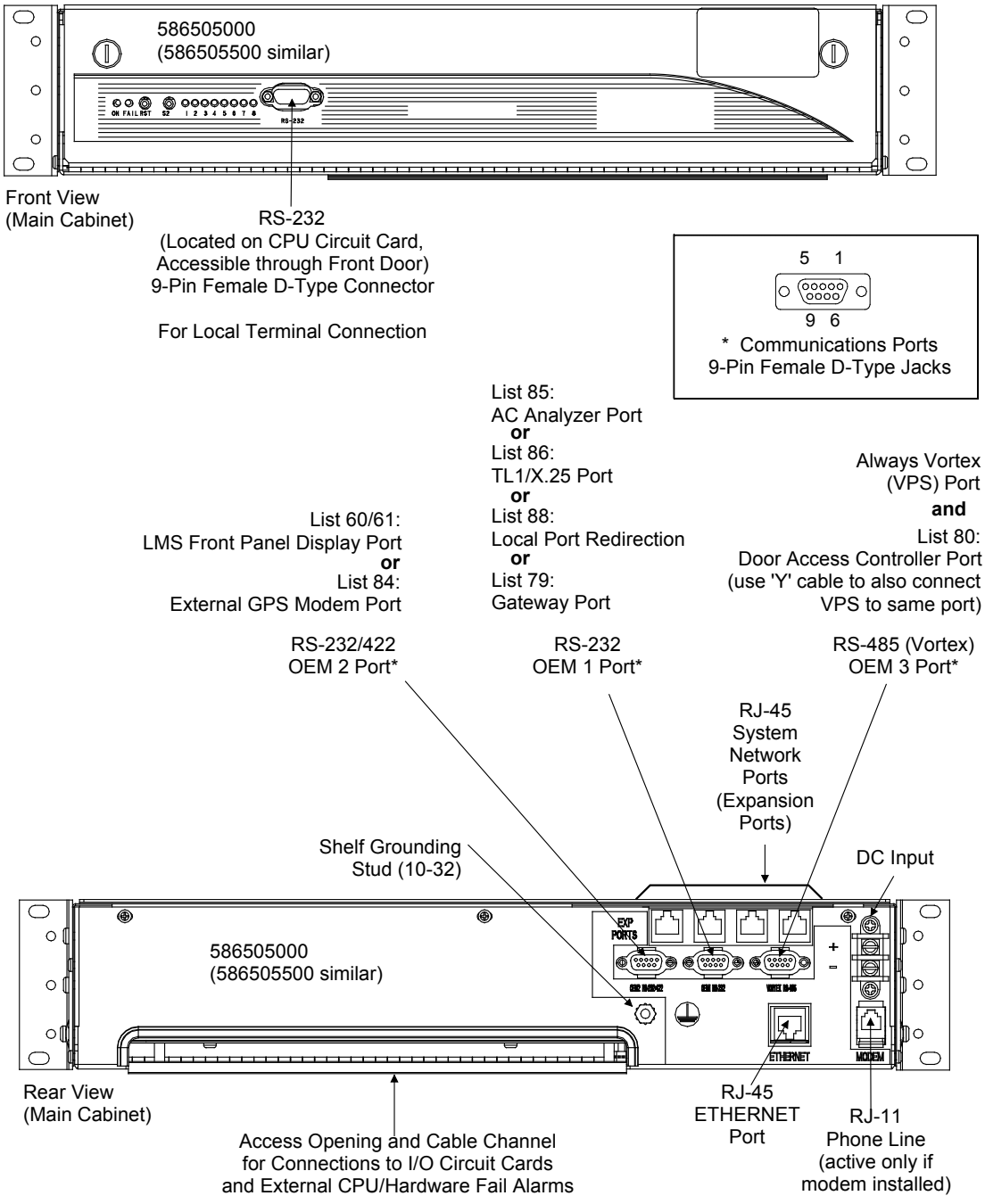
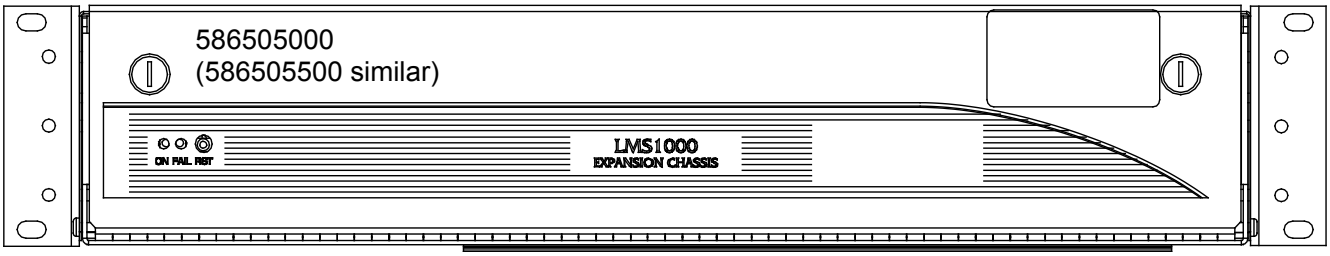
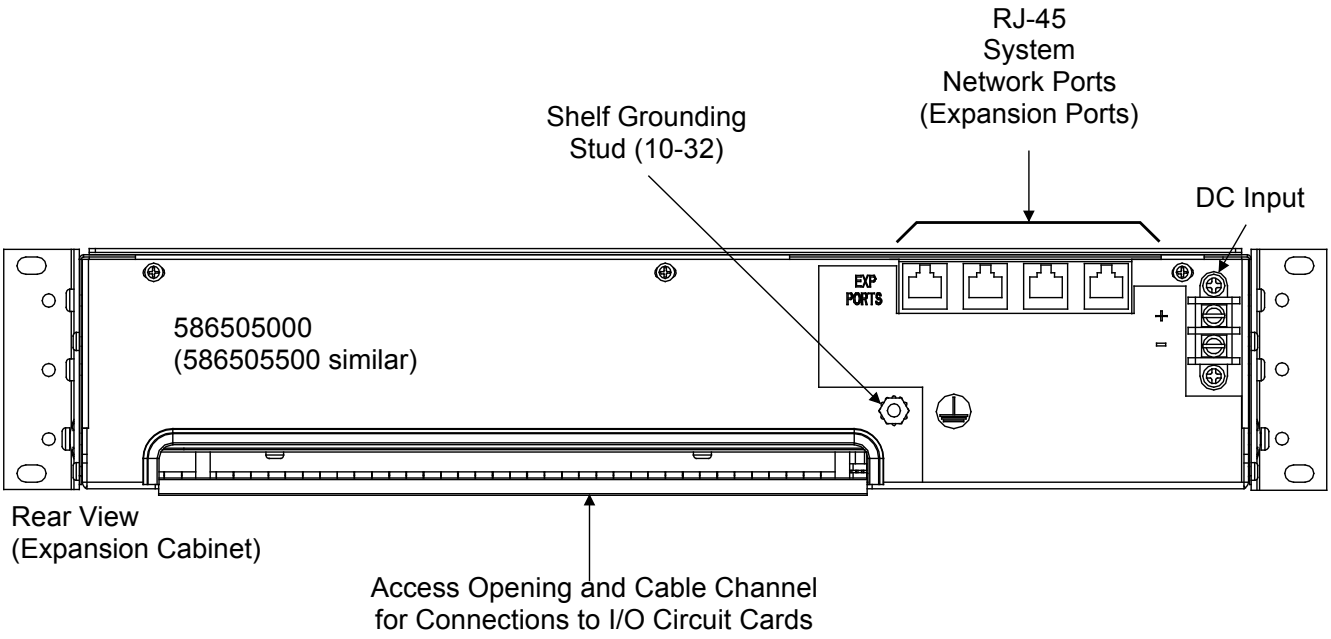


Figure 7. ***586505000/586505500*** *Terminal Location and Identification (cont'd from previous page)*



Front View
(Expansion Cabinet)



Rear View
(Expansion Cabinet)

Access Opening and Cable Channel
for Connections to I/O Circuit Cards

Figure 8. ***582140000/582140001/582126100*** *LMS Terminal Location and Identification (cont'd on next page)*

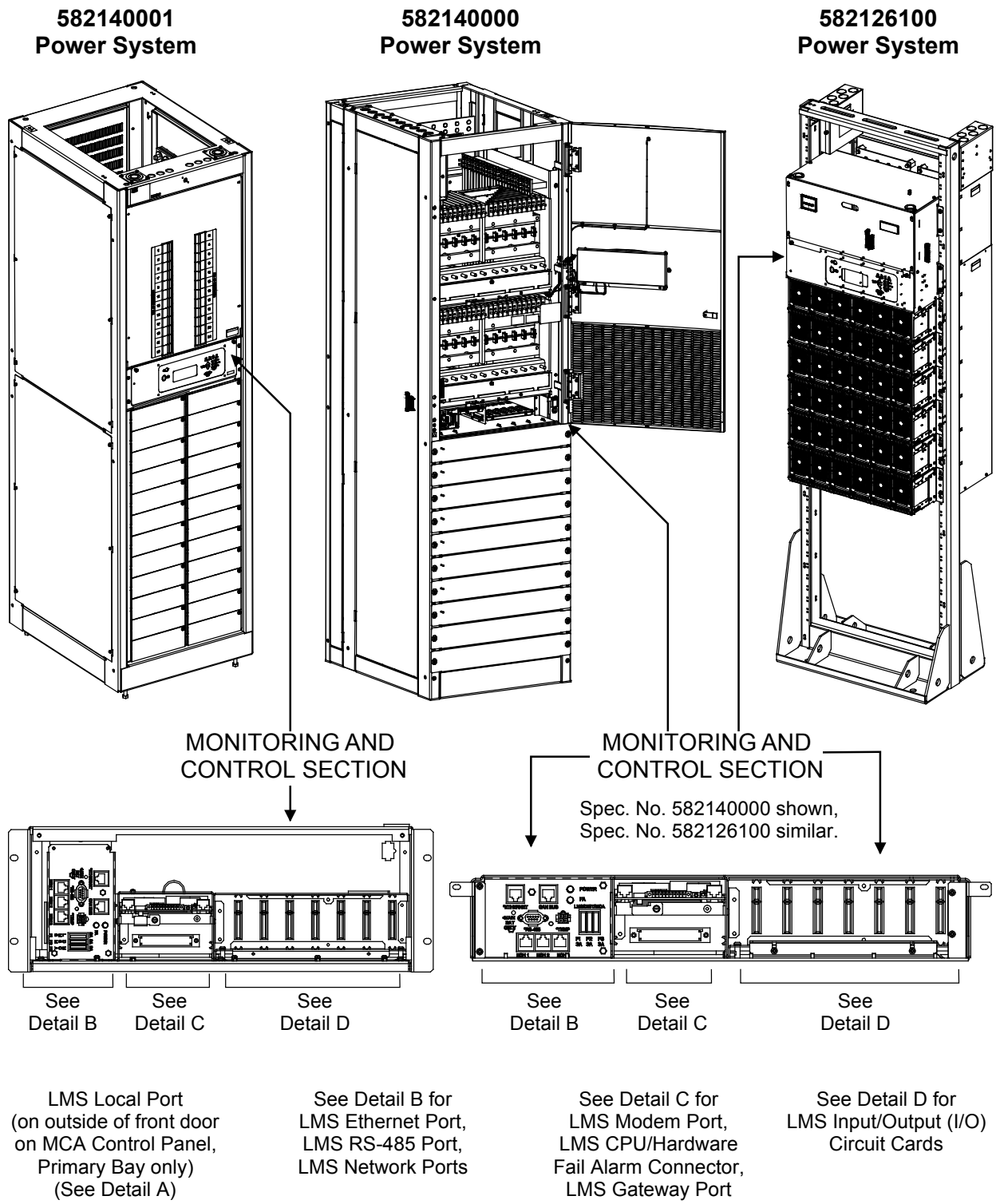


Figure 8. ***582140000/582140001/582126100*** *LMS Terminal Location and Identification (cont'd from previous page, cont'd on next page)*

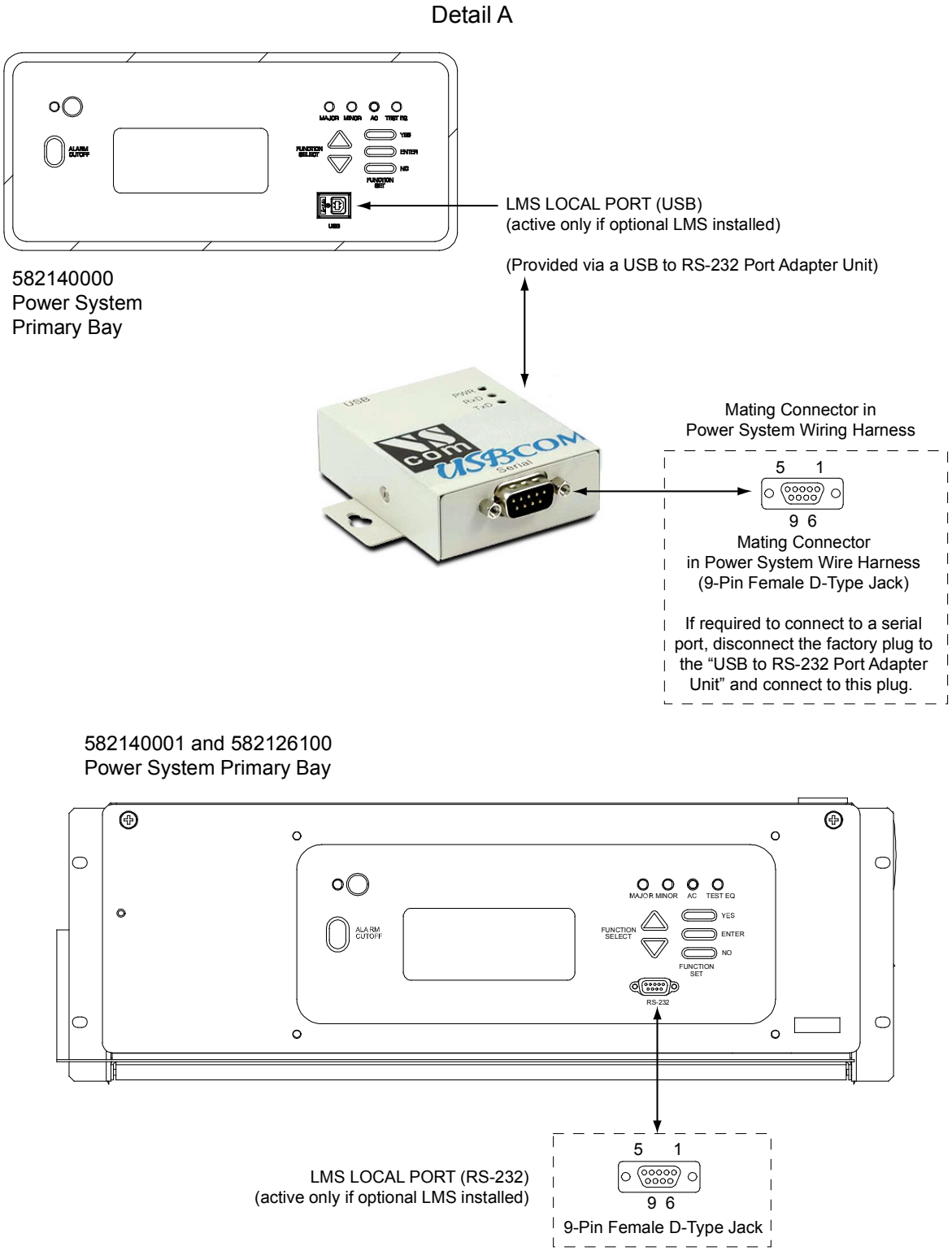


Figure 8. ***582140000/582140001/582126100*** *LMS Terminal Location and Identification (cont'd from previous page, cont'd on next page)*

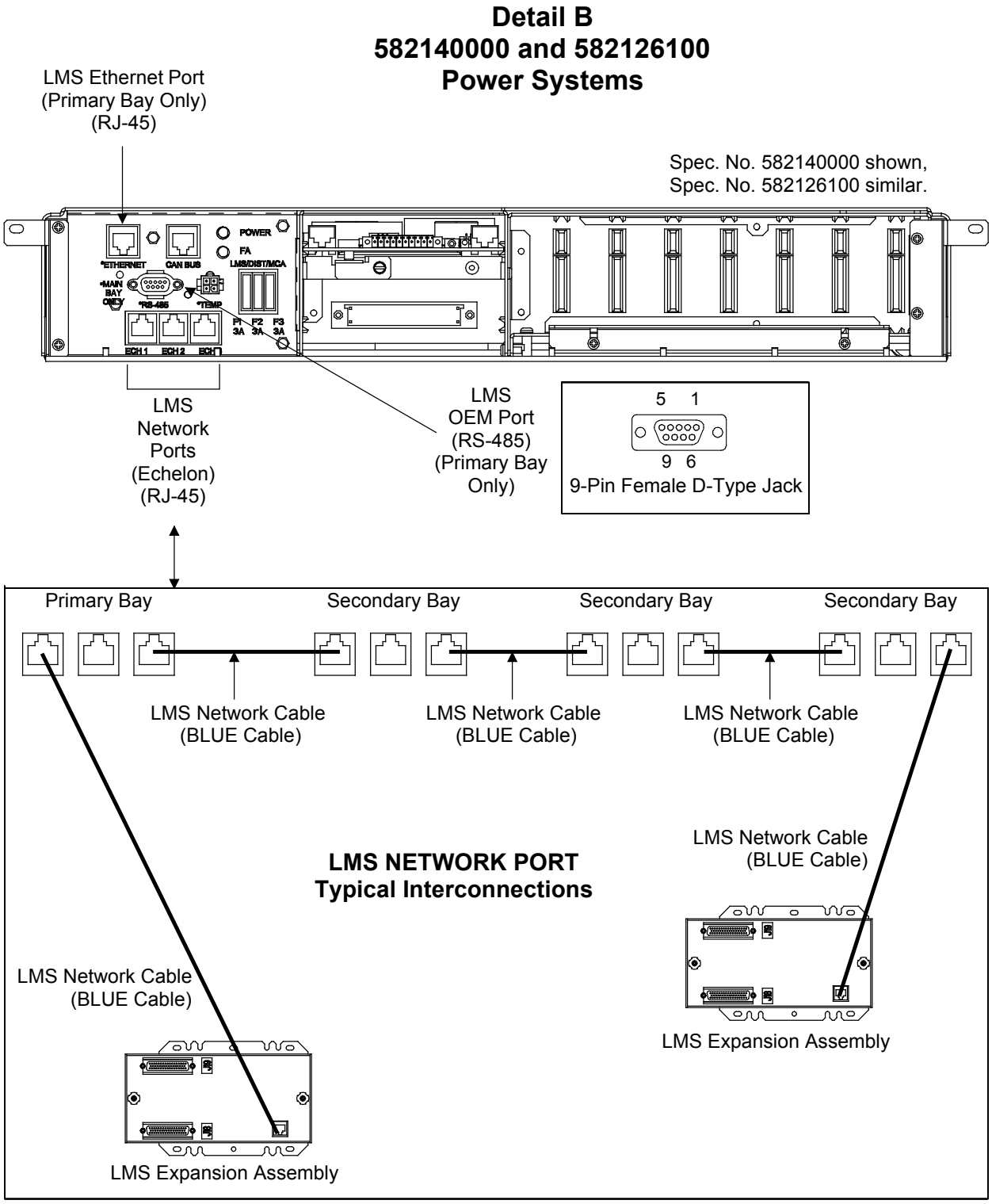


Figure 8. ***582140000/582140001/582126100*** *LMS Terminal Location and Identification (cont'd from previous page, cont'd on next page)*

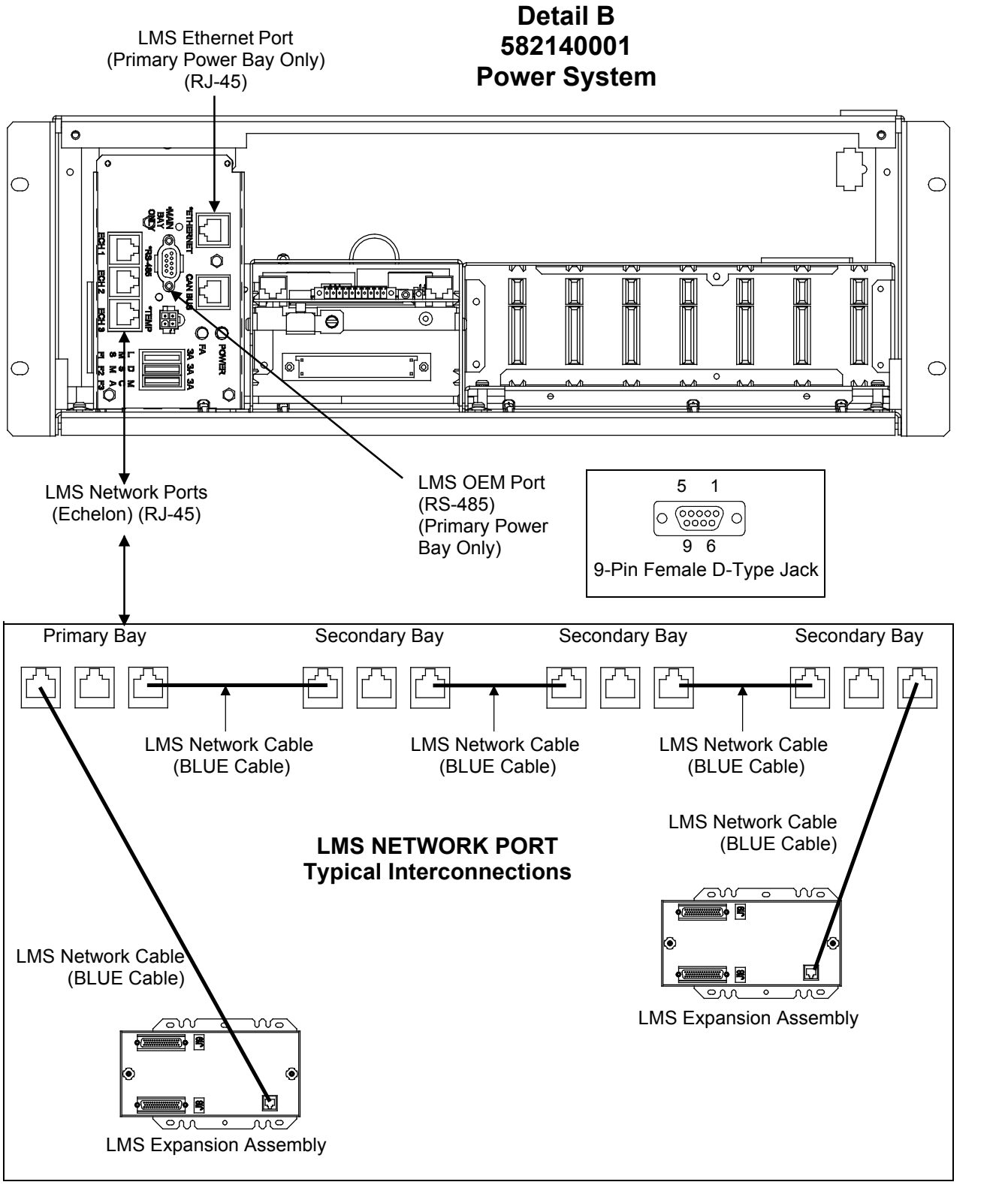
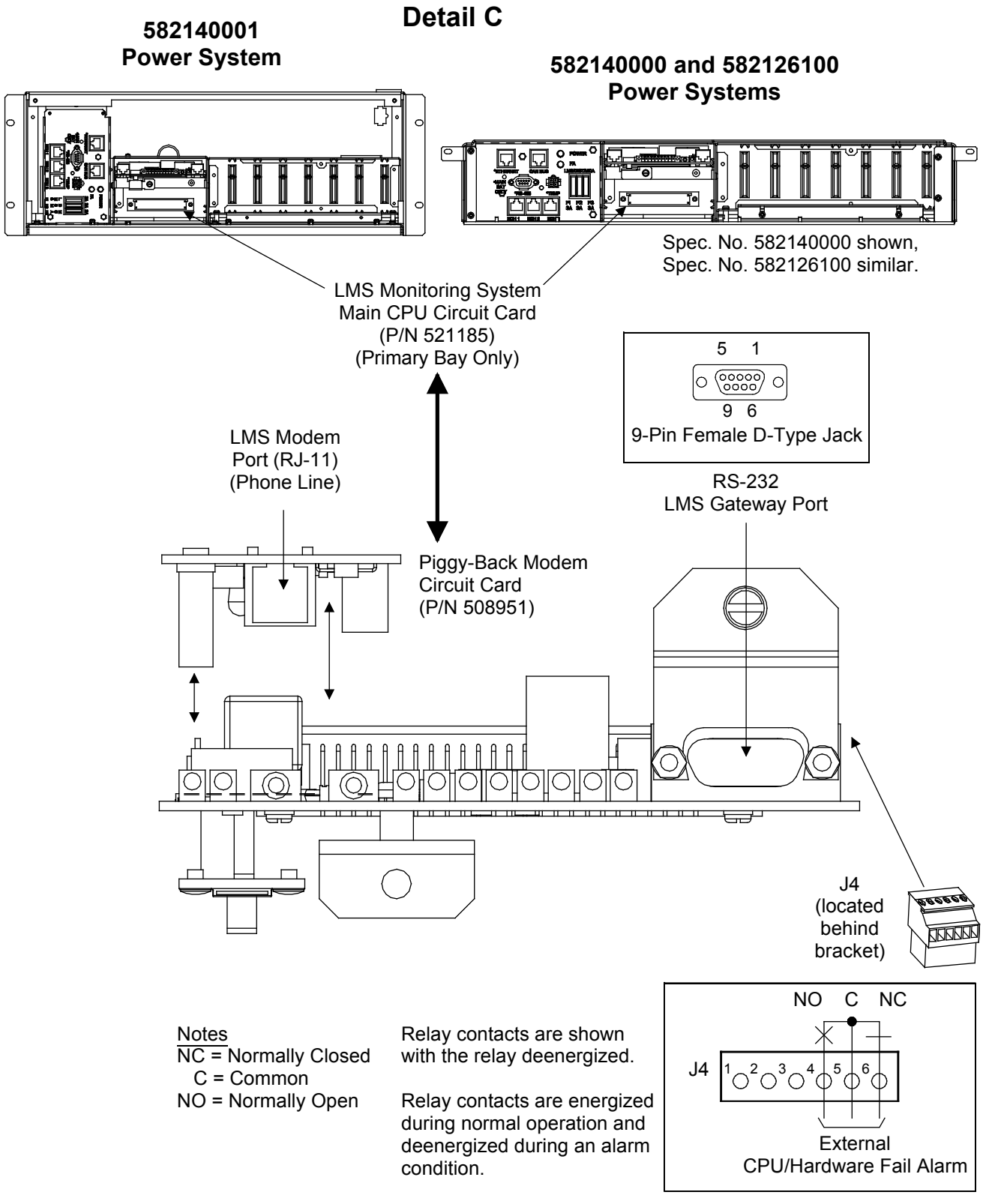


Figure 8. ***582140000/582140001/582126100*** *LMS Terminal Location and Identification (cont'd from previous page, cont'd on next page)*

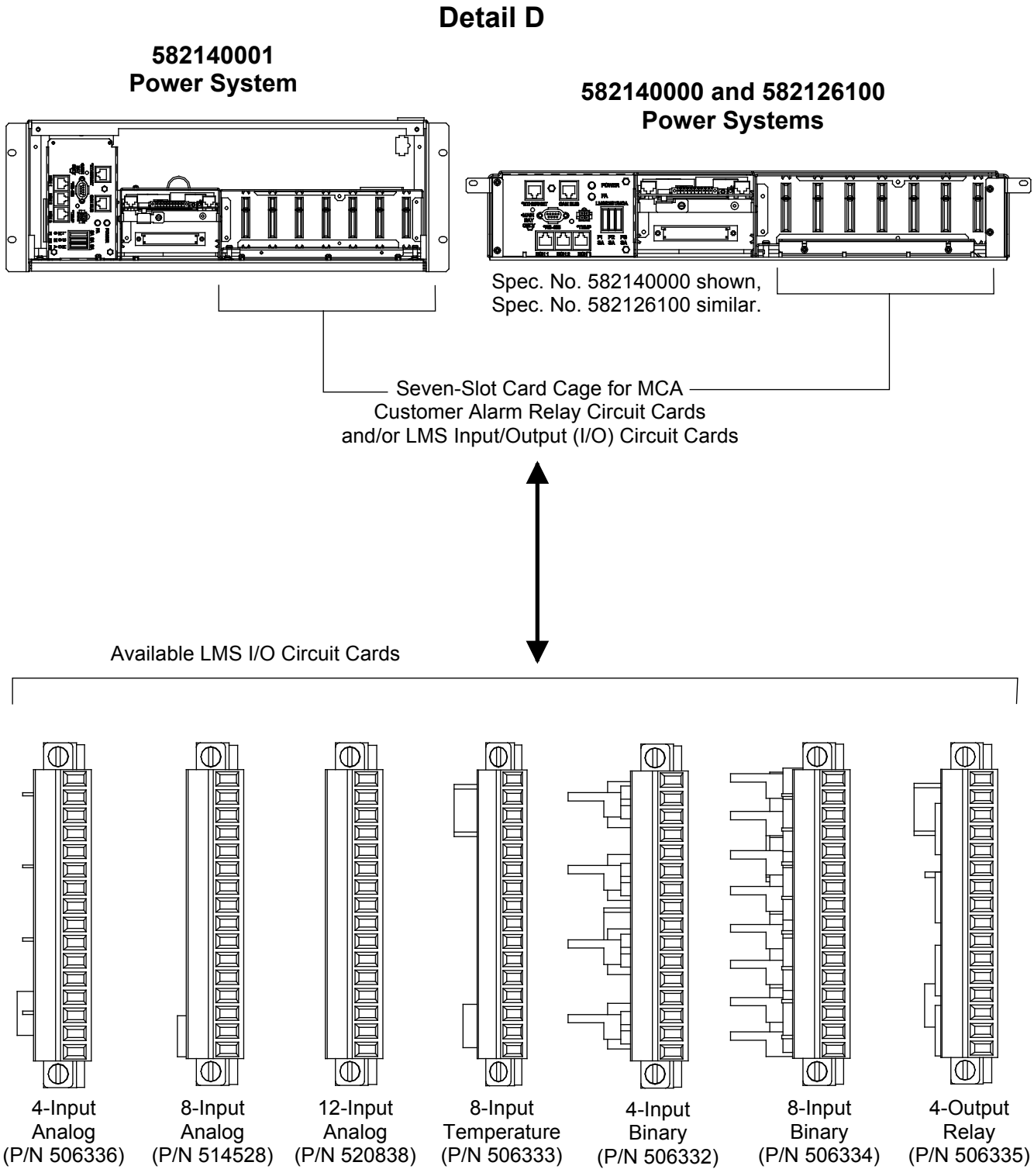


Notes
NC = Normally Closed
C = Common
NO = Normally Open

Relay contacts are shown with the relay deenergized.

Relay contacts are energized during normal operation and deenergized during an alarm condition.

Figure 8. ***582140000/582140001/582126100*** *LMS Terminal Location and Identification (cont'd from previous page)*



External CPU/Hardware Fail Alarm Connections

The external CPU/hardware fail alarm connections are made to terminal block J4 located on the CPU circuit card installed in the 586505000/586505500 LMS1000 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay. Recommended wire size is 22 gauge for loop lengths up to 200 feet, and 18-20 gauge for loop lengths over 200 feet. Stranded twisted pair wire is recommended. To minimize voltage potentials inside the cabinet during installation, alarm relay leads should be connected at the cabinet or bay first. Refer to Figure 7 or Figure 8 for terminal block location.

These leads enter the 586505000/586505500 LMS1000 cabinet at the rear of the cabinet and are routed through a cable channel located on the bottom of the cabinet.

- Terminal block J4 consists of two pieces snapped together. The two pieces can be separated by gently pulling the one half from the other. This feature facilitates circuit card wiring and circuit card replacement, if required.
- Wires are connected to the terminals of J4 by inserting the stripped wire into the wire opening, and then tightening the screw. The wires should be checked for proper installation by gently attempting to pull the wires from the terminal.
- Terminal block J4 accepts a wire size in the range of 28 to 16 gauge. Recommended torque is 4 in-lbs.

PROCEDURE:

1. **586505000/586505500 LMS1000 Main Cabinet:** To access terminal block J4 located on the Main Cabinet CPU circuit card, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100 Power System: Open the front door of the Primary Power Bay to access the LMS Main CPU circuit card.
2. Connect the external CPU/hardware fail alarm to terminals 4 through 6 of J4. An open loop circuit is provided between terminals 4 and 5 of J4, and a closed loop circuit is provided between terminals 5 and 6 of J4 during a CPU/hardware fail alarm condition.
3. **586505000/586505500 LMS1000 Main Cabinet:** If no more connections are to be made inside the cabinet, close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet).
   or
   582140000/582140001/582126100 Power System: If no more connections are to be made inside the bay, close the front door.

Local Terminal Port Connections

586505000/586505500: The local terminal is connected to the 9-pin female D-type jack located on the front of the Main Cabinet, labeled "RS-232". Refer to Figure 7 for jack location. Refer to Table 1 for jack configuration. This jack is configured as a DCE (Data Communication Equipment).

Note: *When 586505000/586505500 List 88 is ordered, the port on the front of the 586505000/586505500 cabinet is inactive, and the local port is redirected to OEM1 located on the rear of the cabinet. List 88 cannot be used in conjunction with 586505000/586505500 List 79 (Gateway Port), List 85 (AC Analyzer Interface), or List 86 (TL1/X.25).*

582140001/582126100: A 9-pin female D-type jack (labeled "RS-232") is provided on the front door of the Primary Power Bay (on the MCA Control Panel) for LMS local terminal connection. Refer to Figure 8 for location. Refer to Table 1 for jack configuration. This jack is configured as a DCE (Data Communication Equipment).

582140000: The 9-pin female D-type jack (LMS RS-232 Local Port) provided in the system wiring harness is factory connected to a USB to RS-232 Port Adapter Unit. The USB to RS-232 Port Adapter Unit is factory connected to the USB port provided on the front door of the Primary Power Bay (on the MCA Control Panel) for LMS local terminal connection. (A device driver CD is supplied with the USB to RS-232 Port Adapter Unit. The proper driver must be installed on the computer to be connected to the USB port.)

Note: *If required to connect to a serial port, disconnect the factory RS-232 jack from the "USB to RS-232 Port Adapter Unit" and connect to this jack. Refer to Table 1 for jack configuration. This jack is configured as a DCE (Data Communication Equipment).*

Table 1. Local Port Pin Assignments (9-Pin Female D-Type Jack) RS-232 Configured as DCE

Port Pin Number	Application	Input/Output
1	-	-
2	Transmitted Data (TxD)	Output from System
3	Received Data (RxD)	Input to System
4	Data Set Ready (/DSR)	Output from System
5	Signal Ground (Gnd)	-
6	Data Terminal Ready (/DTR)	Input to System
7	Clear to Send (/CTS)	Input to System
8	Request to Send (/RTS)	Output from System
9	-	-

Gateway Port Connections (if Gateway Software Option is installed)

The Gateway Software Option allows the LMS1000 to emulate a "dumb" RS-232 asynchronous terminal interface. When installed, user input through either a local or remote LMS1000 port is directed to the customer equipment connected to the LMS1000 Gateway port.

The cable from the LMS1000 Gateway port to the customer equipment must not exceed 50 feet. This cable must be provided by the customer.

586505000/586505500: In the 586505000/586505500 system, the Gateway port is provided via the OEM1 port. Refer to Figure 7 for port location. Refer to Table 3 for port pin assignments. See "OEM1 Port Connections (if required) (586505000/586505500 Only)" later in these instructions.

582140000/582140001/582126100: In the 582140000/582140001/582126100 system, the Gateway port is provided via the port located on the front of the LMS CPU circuit card installed in the Primary Power Bay. This is a 9-pin female D-type jack (RS-232). Refer to Figure 8 for location. Refer to Table 2 for port pin assignments.

Table 2. Port Located on Front of Main LMS CPU Circuit Card Installed in Primary Power Bay (9-Pin Female D-Type Jack) RS-232 Configured as DCE

Port Pin Number	Application	Input/Output
1	-	-
2	Transmitted Data (TxD)	Output from System
3	Received Data (RxD)	Input to System
4	Data Set Ready (/DSR)	Output from System
5	Signal Ground (Gnd)	-
6	Data Terminal Ready (/DTR)	Input to System
7	Clear to Send (/CTS)	Input to System
8	Request to Send (/RTS)	Output from System
9	-	-

Internal Modem Port Connections

WARNING! The intra-building port(s) of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly MUST NOT be metallically connected to interfaces that connects to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring. Use shielded phone cable (grounded at both ends). Note that the LMS1000 RJ-11 jack is connected to chassis ground.

586505000/586505500: If a modem circuit card is installed, the remote communications phone line connection is made to the RJ-11 jack located on rear of the Main Cabinet. Refer to Figure 7 for RJ-11 location.

582140000/582140001/582126100 System: An internal modem circuit card may be installed on the LMS Main CPU circuit card. The modem circuit provides an RJ-11 phone jack for customer phone line connection. Refer to Figure 8 for location.

Ethernet Port Connections (10M)

Note: *The LMS supports an Ethernet connection speed up to 10mbps.*

Note: *Also used for the TL1 Port if 'TL1 over Ethernet' software option installed.*

586505000/586505500: The Main Cabinet is connected to the customer's network running TCP/IP via the RJ-45 jack located on the rear of the cabinet, labeled "ETHERNET". Refer to Figure 7 for jack location. Jack pin configuration is a standard Ethernet scheme, twisted pair (T568A or T568B), 10BaseT, and half duplex.

Use shielded Ethernet cable (grounded at both ends). Note that the LMS1000 RJ-45 jack is connected to chassis ground.

582140000/582140001/582126100: An RJ-45 jack (labeled "ETHERNET") is provided inside the Primary Power Bay (near the LMS Main CPU circuit card) for connection into a customer's network running TCP/IP. Refer to Figure 8 for location. Jack pin configuration is a standard Ethernet scheme, twisted pair (T568A or T568B), 10BaseT, and half duplex.

Use shielded Ethernet cable (grounded at both ends). Note that the LMS RJ-45 jack is connected to chassis ground.

OEM1 Port Connections (if required) (586505000/586505500 Only)

Connections to the OEM1 port are made to a 9-pin female D-type jack located on the rear of the Main Cabinet, labeled "OEM1 (RS-232)". Refer to Figure 7 for jack location. Refer to Table 3 for jack configuration. The port's function is determined by the LMS1000 Software Options or LMS1000 Specialty Interfaces installed.

Local Port Redirection (if 586505000/586505500 List 88 installed), (Cannot be used in conjunction with 586505000/586505500 List 79 [Gateway Port], List 85 [AC Analyzer Interface], or List 86 [TL1/X.25].)

The port on the front of the cabinet is inactive, and the local port is redirected to OEM1 located on the rear of the cabinet. Make local terminal connection here, not to the front panel jack. OEM1 port pin assignments are as shown in Table 3.

TL1/X.25 Port (if 586505000/586505500 List 86 installed), (Cannot be used in conjunction with 586505000/586505500 List 79 [Gateway Port], List 85 [AC Analyzer Interface], or List 88 [Local Port Redirection].)

The OEM1 port provides asynchronous output for interfacing to a network interface device (an X.25 PAD or similar device). Connect the OEM1 port to a network interface device of a PSDN (Packet Switched DATA Network). Maximum cable length from the network device to the OEM1 port is 50 feet. The customer must provide this cable. OEM1 port pin assignments are as shown in Table 2-3.

A feature of the LMS1000 TL1/X.25 port is to provide customer control of the port's output data flow. The output data flow is enabled or disabled based on the state of a hardware handshake signal. If this signal is present, the port's data flow is enabled. If a hardware handshake signal is to be provided by the customer, connect this signal to the LMS1000 TL1/X.25 port on Pin 8 "Clear to Send (CTS)".

If a hardware handshake signal is not provided by the customer, jumper Pin 7 "Request to Send (RTS)" to Pin 8 "Clear to Send (CTS)".

WARNING! The handshake signal is used to prevent the system from transmitting reports when the network connection is not available. If no handshake signal is provided, reports will be transmitted immediately upon alarm/errant occurrence and may be lost if the network device is not ready to receive them.

AC Analyzer Interface Port (if 586505000/586505500 List 85 installed), (Cannot be used in conjunction with 586505000/586505500 List 79 [Gateway Port], List 86 [TL1/X.25], or List 88 [Local Port Redirection].)

Connect the OEM1 Port to a Dossena AC Analyzer Model MV3DL. OEM1 port pin assignments are as shown in Table 3.

Table 3. OEM1 Port Pin Assignments (9-Pin Female D-Type Jack) RS-232 Configured as DTE

Port Pin Number	Application	Input/Output
1	-	-
2	Received Data (RxD)	Input to System
3	Transmitted Data (TxD)	Output from System
4	Data Terminal Ready (/DTR)	Output from System
5	Signal Ground (Gnd)	-
6	Data Set Ready (/DSR)	Input to System
7	Request to Send (/RTS)	Output from System
8	Clear to Send (/CTS)	Input to System
9	-	-

Gateway Port (if 586505000/586505500 List 79 installed), (Cannot be used in conjunction with 586505000/586505500 List 85 [AC Analyzer Interface], List 86 [TL1/X.25], or List 88 [Local Port Redirection].)

See "Gateway Port Connections" earlier in this document.

OEM2 Port Connections (if required) (586505000/586505500 Only)

Connections to the OEM2 port are made to a 9-pin female D-type jack located on the rear of the Main Cabinet, labeled "OEM2 (RS-232/422)". Refer to Figure 7 for jack location. Refer to Table 4 and Table 5 for jack configuration. The port's function is determined by the LMS1000 Software Options or LMS1000 Specialty Interfaces installed.

External Modem Interface Port (if 586505000/586505500 List 84 installed), (Cannot be used in conjunction with 586505000/586505500 List 60, 61, 62, or 63 [LMS1000 Front Panel Display Option].)

Connect the OEM2 Port to an Enfora GPS Modem. OEM2 port pin assignments are as shown in Table 4.

Table 4. OEM2 Port Pin Assignments (9-Pin Female D-Type Jack) Software Selected for RS-232 Connection, Configured as DTE

Port Pin Number	Application	Input/Output
1	Data Carrier Detect (/DCD)	Input to System
2	Received Data (RxD)	Input to System
3	Transmitted Data (TxD)	Output from System
4	Data Terminal Ready (/DTR)	Output from System
5	Signal Ground (Gnd)	-
6	Data Set Ready (/DSR)	Input to System
7	Request to Send (/RTS)	Output from System
8	Clear to Send (/CTS)	Input to System
9	-	-

Table 5. OEM2 Port Pin Assignments (9-Pin Female D-Type Jack) Software Selected for RS-422 Connection, Configured as DTE

Port Pin Number	Application	Input/Output
1	Received Data (RxD-)	Input to System
2	Received Data (RxD+)	Input to System
3	Transmitted Data (TxD+)	Output from System
4	Transmitted Data (TxD-)	Output from System
5	Signal Ground (Gnd)	-
6	Handshake Out (HSO-)	Output from System
7	Handshake Out (HSO+)	Output from System
8	Handshake In (HSI+)	Input to System
9	Handshake In (HSI-)	Input to System

OEM3 Port Connections (if required) (586505000/586505500 Only)

This port always functions as a Vortex Power System (VPS) or NETSURE Power System (NPS) Interface Port. The port may also have other functions as determined by the LMS1000 Software Options or LMS1000 Specialty Interfaces installed.

Vortex Power System (VPS) or NETSURE Power System (NPS) Port

A cable is connected between the 9-pin female D-type VPS/NPS Port jack (labeled "OEM3 [VORTEX RS-485]") located on the rear of the Main Cabinet, and the appropriate RJ-45 jack located on the VPS/NPS cabinet. Refer to Figure 7 for location of the VPS/NPS Port jack on the rear of the Main Cabinet. Refer to the VPS/NPS documentation for location of the RJ-45 jack on the VPS/NPS. Refer to the next section for cable specifications and assembly instructions. Maximum cable length from LMS1000 to the VPS/NPS is 4,000 feet.

Note: *At this time install the supplied ferrite cable clamp onto the cable at any convenient location near the VPS/NPS.*

VPS/NPS INTERFACE CABLE SPECIFICATIONS

LMS1000 is connected to the VPS/NPS with a multi-conductor cable that is terminated on one end with a 9-pin male D-type plug, and on the other end with an RJ-45 plug. These plugs mate with the 9-pin female D-type VPS/NPS Port jack provided on LMS1000 (refer to Figure 7) and the appropriate RJ-45 jack provided on the VPS/NPS.

A cable with the appropriate plugs attached to both ends may be supplied, or a length of cable with two unconnected plugs may be supplied, as ordered. If required, the installer is to assemble the cable per these specifications and per site requirements.

The recommended cable is a category 5, four twisted pair conductor, 24 gauge solid copper cable. Emerson Network Power P/N 156202100. Belden P/N 1585AD15. If this cable is ordered through Emerson Network Power, specify the required length in 5 feet increments. A six foot cable with appropriate plugs pre-attached is also available (P/N 421843500).

The required components necessary to terminate the cable are provided in a kit offered by Emerson Network Power. The Emerson Network Power part number of this kit is 483590800 and consists of:

a. One (1) RJ-45 plug. Emerson Network Power P/N 247809900. AMP P/N 557315.

b. One (1) 9-pin male D-type plug. Emerson Network Power P/N 247882220. AMP P/N 205204-4.

c. Four (4) snap-in crimp type contacts. Emerson Network Power P/N 245381800. AMP P/N 66506-3.

d. One (1) cable clamp assembly kit. Emerson Network Power P/N 247835712. AMP P/N 207908-1.

VPS/NPS INTERFACE CABLE ASSEMBLY

Attach a plug to each end of the cable per Table 6, and the following instructions.

Attaching RJ-45 Plug

1. Trim and strip (0.5 - 0.56 inch) jacketed cable using appropriate, commercially available tools.

Note: *Do not strip insulated wires.*

2. Insert the wires completely into the RJ-45 plug. Visually inspect the assembly to ensure proper routing of the individual conductors. If using the recommended cable, follow the color scheme shown in Table 6. Refer to Figure 9 for the pin numbering scheme of the RJ-45 plug.

3. Terminate the cable using appropriate crimp tool, AMP P/N 2-231652-1 with die set AMP P/N 853400-1.

Attaching 9-Pin Male D-Type Plug

1. Trim and strip (0.75 inch) jacketed cable using appropriate, commercially available tools.
2. Attach the crimp type contacts to the wires of the cable using a crimp tool, AMP P/N 90302-1, or 90312-1, or 404494-7. (Strip the wires approximately one quarter of an inch.) If using the recommended cable, follow the color scheme shown in Table 2-6.
3. Insert the crimp type contacts (with wires attached) into the plug housing using an insertion/extraction tool, AMP P/N 91067-2. A single ended insertion tool is also available, AMP P/N 91234-1.
4. Assemble the retaining clips onto the receptacle flanges with the threaded hole facing toward the wire side of the connector.

Attaching Cable Clamp Assembly

1. A carrier strip with strain-relief gates is packaged with each assembly. Remove the curved gate and large blank gate from the carrier strip.
2. Insert the curved gate into the cable clamp slot as shown in Figure 10. Insert the large blank gate into the unused slot.
3. Insert the plug into the clamp with the longer row of contacts in the bottom (portion of cable clamp which is slotted for cable). Position the cable in the strain relief channel.
4. Position the cable over the curved gate and close the cable clamp.
5. Thread the screws into the holes in the cable clamp and tighten them to complete the assembly.

Table 6. VPS/NPS Interface Cable Wiring

Recommended Wire Color	From RJ-45 Jack Located on VPS/NPS Pin Number	To 9-Pin D-Type Jack Located on LMS1000 Pin Number
white/blue stripe	1	3
blue	2	2
white/orange stripe	3	-
orange	4	-
white/green stripe	5	-
green	6	-
white/brown stripe	7	-
brown	8	5

Figure 9. RJ-45 Plug

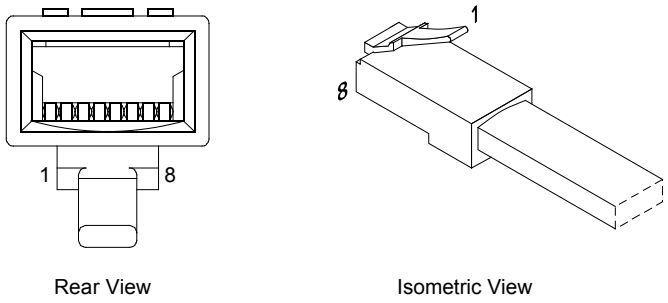
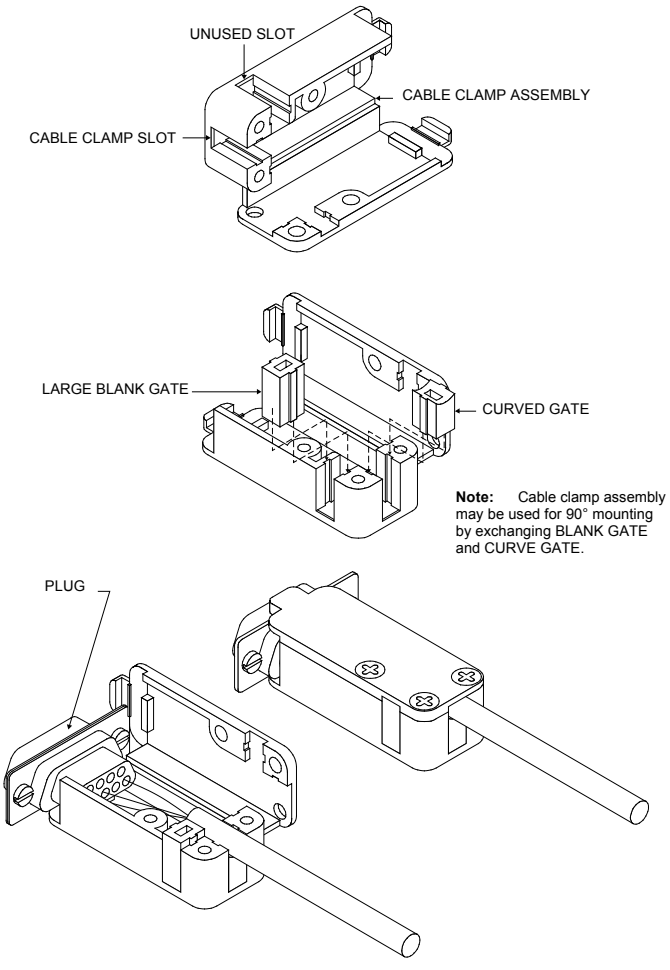


Figure 10. Assembling Cable Clamp Assembly


UNUSED SLOT
CABLE CLAMP ASSEMBLY
CABLE CLAMP SLOT
LARGE BLANK GATE
CURVED GATE
Note: Cable clamp assembly may be used for 90° mounting by exchanging BLANK GATE and CURVE GATE.
PLUG

Door Access Controller (DAC) Port (if 586505000/586505500 List 80 installed)

Connect the OEM3 Port to a Desarrollos Digitales Door Access Controller Model MKC-1. OEM3 port pin assignments are as shown in Table 7.

Note: *Recommended to use a Desarrollos Digitales Isolation Board (Model DTP-1-485 / 96-DC24-T, E) between the DAC and LMS1000.*

If you need to also connect the LMS1000 to a Vortex Power System or NETSURE Power System, customer must assemble a "Y" cable to allow both the Door Access Controller and the Power System to be connected to the LMS1000 OEM3 Port.

You will also have to connect an LMS1000 output relay to the Access Door's electronic strike. This allows you to manually bypass the Door Access Controller to lock and unlock the door if the Door Access Controller should fail.

Table 7. OEM3 Port Pin Assignments (9-Pin Female D-Type Jack) RS-232 Configured as DCE

Port Pin Number	Application	Input/Output
1	--	--
2	Transmitted Data (TxD)	Output from System
3	Received Data (RxD)	Input to System
4	--	--
5	Signal Ground (Gnd)	--
6	--	--
7	--	--
8	--	--
9	--	--

582140000/582140001/582126100 Power System's LMS RS-485 Port Connections (RS-485 Port)

A 9-pin female D-type jack (labeled "RS-485") is provided inside the Primary Power Bay (near the LMS1000 Main CPU circuit card) for customer OEM connections. Refer to Figure 8 for location. This port is not active at this time. It is for future enhancements.

LMS1000 Input/Output (I/O) Circuit Card Connections

The input/output (I/O) connections are made to terminal blocks located on the front of each LMS1000 I/O circuit card.

Note: *Refer to " Operating LMS1000" in the* User Instructions *(Section 5847) for a description of the I/O Numbering Scheme. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

As a help in later identifying the installed LMS1000 I/O circuit cards and programming the various channels of the system, the worksheets (or copies of) located at the end of this section can be filled out as the various LMS1000 I/O circuit cards are wired.

Making Connections to an LMS1000 Input/Output (I/O) Circuit Card

Each LMS1000 I/O circuit card installed in the system contains a 16 position terminal block located at the edge of the circuit card. The terminal blocks consists of two pieces snapped together. The two pieces can be separated by first loosening the two screws, then gently pulling the one half from the other. This feature facilitates circuit card wiring and circuit card replacement, if required.

Wires are connected to the terminals by inserting the stripped wire into the wire opening, and then tightening the screw. The wire should be checked for proper installation by gently attempting to pull the wire from the terminal. Leave enough slack in the wires to allow the I/O circuit card connector to be removed without stretching the wires.

The terminal blocks accept a wire size in the range of 28 to 16 gauge. Recommended torque is 4 in-lbs.
To minimize voltage potentials inside the cabinet or bay during installation, leads should be connected at the cabinet or bay first, and then connected to the monitored source.

586505000/586505500: Leads enter the cabinet at the rear of the cabinet and are routed through a cable channel located on the bottom of the cabinet. Leave enough slack in the wires to allow the I/O circuit card connector to be removed without stretching the wires. Ensure the wires cannot be pinched when the cabinet door is opened or closed.

Note: *Using wire sizes greater than those recommended in the next sections may cause mechanical interference.*

FOUR INPUT ANALOG CIRCUIT CARD P/N 506336 CONNECTIONS

Connections to an analog circuit card are made to terminal block TB1 located at the edge of the circuit card. Refer to "Making Connections to an LMS1000 Input/Output (I/O) Circuit Card" in this section for terminal block TB1 connection information. Refer to Figure 11 for terminal block pinouts.

The four input analog circuit card is designed with two pairs of terminals for each input. This allows the circuit card to monitor a variety of sources. One pair of terminals is provided for connection of DC voltages from 0 to 60 volts DC, designated as "large signal". A second pair of terminals is provided for connection of 50 mv shunts, 100 mv shunts, and 20 ma current loop signals, designated as "small signal".

Recommended wire size is 20-22 gauge, twisted pair wire. Observe correct polarity when connecting shunts and voltages. Twenty milliamp loops should be connected in reverse polarity. Each of the two leads should be protected using a 1.0 ampere fuse

when monitoring voltages, or a 49.9Ω fusible resistor when monitoring shunts. The protection devices should be located as near as possible to the voltage or current source to provide maximum protection.

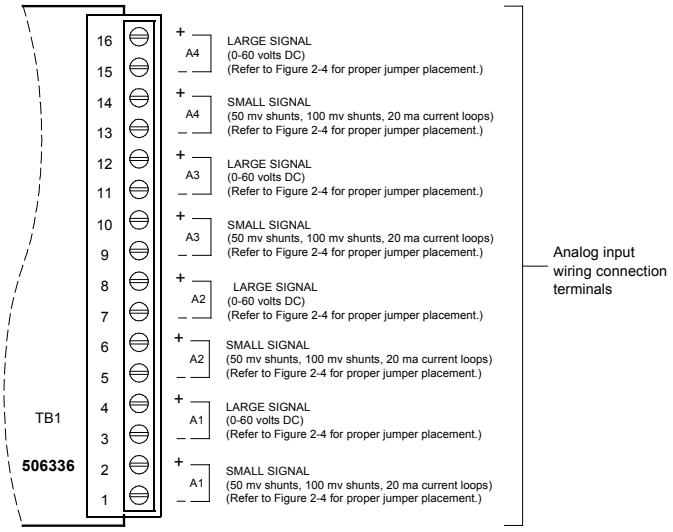
Recommended Maximum Analog Input Loop Lengths:
Shunt Inputs: maximum 2,000 ft. loop length.
Voltage Inputs: maximum 1,000 ft. loop length.
These maximum distances are derived from calculations which would yield a typical 0.1% of full scale error at the maximum loop length (using 22 gauge hook-up wire). Loop length is the sum of the lengths of the positive and negative leads.

Note: *No error is introduced when using 0-20mA or 4-20mA current loops less than 20,000 ft. Assumes transducer can drive 500 ohm impedance.*

Procedure:

1. **586505000/586505500:** To access terminal block TB1 located on an analog circuit card, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100: Open the bay's front door.
2. Connect the leads as shown in Figure 11. Ensure that the jumper associated to each input is correctly set, as previously described in this section. Connect to only one pair of terminals provided for each input.
3. **586505000/586505500:** If no more connections are to be made inside the cabinet, close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet).
   or
   582140000/582140001/582126100: If no more connections are to be made inside the bay, close the bay's front door.

Figure 11. Connection to a Four Input Analog Circuit Card, P/N 506336



Note:
Analog input designations A1 through A4 as shown are for the circuit card only. The actual analog channel number depends upon the quantity of analog and temperature circuit cards installed and location of this analog circuit card in the system network.

EIGHT INPUT ANALOG CiRCUIT CARD P/N 514528 CONNECTIONS

Connections to an analog circuit card are made to terminal block TB1 located at the edge of the circuit card. Refer to "Making Connections to an LMS1000 Input/Output (I/O) Circuit Card" in this section for terminal block TB1 connection information. Refer to Figure 12 for terminal block pinouts.

The eight input analog circuit card is designed with one pair of terminals for each input. Only connect 50 mv shunt inputs to this circuit card.

Note: *Common mode voltage between inputs must not exceed –0.15 to +0.95 volts. The negative input to channel 1 serves as the reference to all analog channels.*

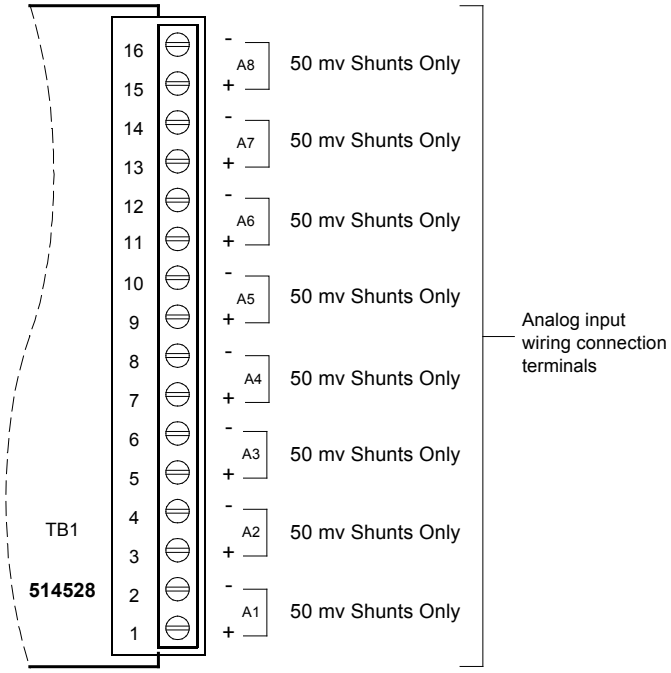
Recommended wire size is 20-22 gauge, twisted pair wire. Observe correct polarity. Each of the two leads should be protected using a 49.9Ω fusible resistor. The protection devices should be located as near as possible to the voltage source to provide maximum protection.

Recommended Maximum Analog Input Loop Lengths:
Shunt Inputs: maximum 2,000 ft. loop length.
These maximum distances are derived from calculations which would yield a typical 0.1% of full scale error at the maximum loop length (using 22 gauge twisted hook-up wire). Loop length is the sum of the lengths of the positive and negative leads.

Procedure:

1. **586505000/586505500:** To access terminal block TB1 located on an analog circuit card, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100: Open the bay's front door.
2. Connect the leads as shown in Figure 12.
3. **586505000/586505500:** If no more connections are to be made inside the cabinet, close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet).
   or
   582140000/582140001/582126100: If no more connections are to be made inside the bay, close the bay's front door.

Figure 12. Connection to an Eight Input Analog Circuit Card, P/N 514528



Note:
Analog input designations A1 through A8 as shown are for the circuit card only. The actual analog channel number depends upon the quantity of analog and temperature circuit cards installed and location of this analog circuit card in the system network.

TWELVE INPUT ANALOG CIRCUIT CARD P/N 520838 CONNECTIONS

Connections to an analog circuit card are made to terminal block TB1 located at the edge of the circuit card. Refer to "Making Connections to an LMS1000 Input/Output (I/O) Circuit Card" in this section for terminal block TB1 connection information. Refer to Figure 13 for terminal block pinouts.

The twelve input analog circuit card is designed to monitor individual battery cell voltages.

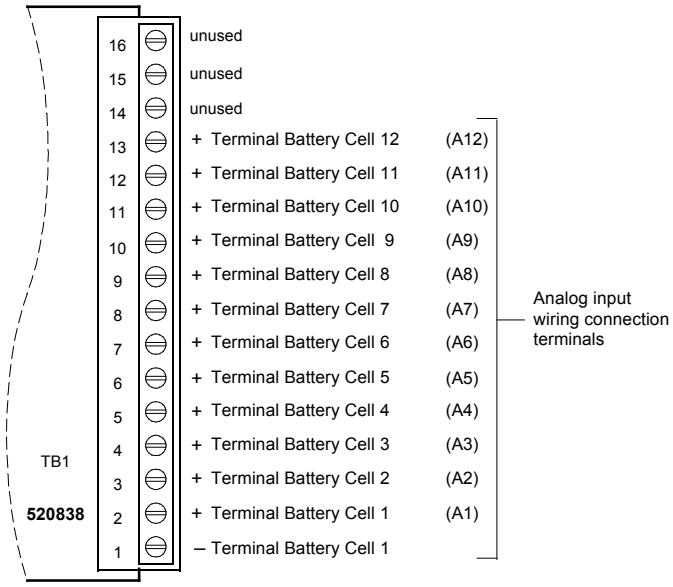
Recommended wire size is 20-22 gauge, twisted pair wire. Observe correct polarity when connecting leads. Each of the two leads should be protected using a 1.0 ampere fuse. The protection devices should be located as near as possible to the voltage source to provide maximum protection.

Procedure:

1. **586505000/586505500:** To access terminal block TB1 located on an analog circuit card, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100: Open the bay's front door.
2. Connect the leads as shown in Figure 13.

   Note: *If wiring less than 12 inputs, wire in order (starting with input #1 and working your way towards input #12). DO NOT skip any input positions.*
3. **586505000/586505500:** If no more connections are to be made inside the cabinet, close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet).
   or
   582140000/582140001/582126100: If no more connections are to be made inside the bay, close the bay's front door.

Figure 13. Connection to a Twelve Input Analog Circuit Card, P/N 520838


16 unused
15 unused
14 unused
13 + Terminal Battery Cell 12 (A12)
12 + Terminal Battery Cell 11 (A11)
11 + Terminal Battery Cell 10 (A10)
10 + Terminal Battery Cell 9 (A9)
9 + Terminal Battery Cell 8 (A8)
8 + Terminal Battery Cell 7 (A7)
7 + Terminal Battery Cell 6 (A6)
6 + Terminal Battery Cell 5 (A5)
5 + Terminal Battery Cell 4 (A4)
4 + Terminal Battery Cell 3 (A3)
3 + Terminal Battery Cell 2 (A2)
2 + Terminal Battery Cell 1 (A1)
1 – Terminal Battery Cell 1
TB1
520838
Analog input wiring connection terminals

Note:
Analog input designations A1 through A12 as shown are for the circuit card only. The actual analog channel number depends upon the quantity of analog and temperature circuit cards installed and location of this analog circuit card in the system network.

FOUR INPUT BINARY CIRCUIT CARD P/N 506332 CONNECTIONS

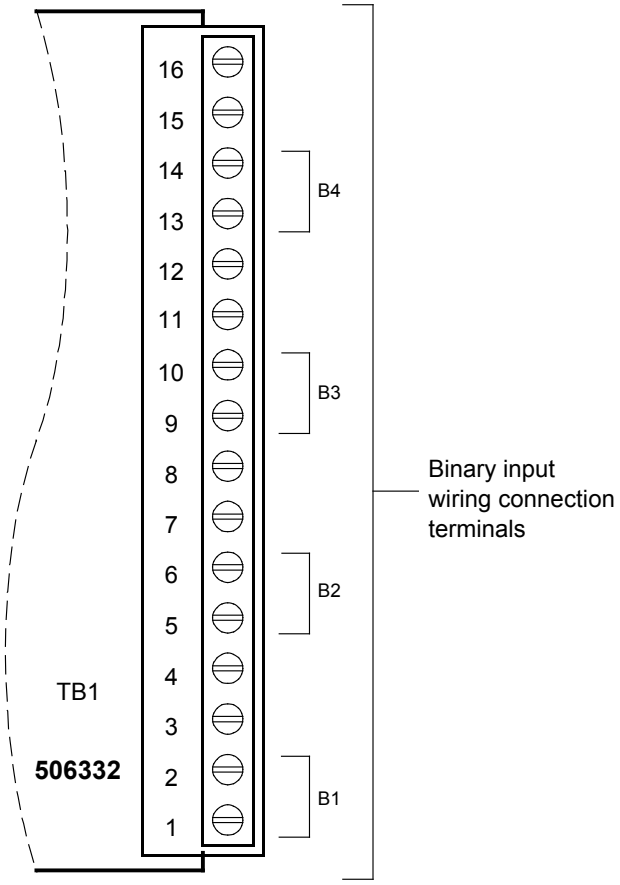
Connections to a binary circuit card are made to terminal block TB1 located at the edge of the circuit card. Refer to "Making Connections to an LMS1000 Input/Output (I/O) Circuit Card" in this section for terminal block TB1 connection information. Refer to Figure 14 for terminal block pinouts.

Recommended wire size is 20-22 gauge, twisted pair wire. A 49.9Ω fusible resistor, located in each input lead, may be used to protect leads from unintentional shorts during installation or service. These resistors should be located as near as possible to the voltage source to provide maximum protection.

Procedure:

1. **586505000/586505500:** To access terminal block TB1 located on a binary circuit card, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100: Open the bay's front door.
2. Connect the leads as shown in Figure 14.
3. **586505000/586505500:** If no more connections are to be made inside the cabinet, close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet).
   or
   582140000/582140001/582126100: If no more connections are to be made inside the bay, close the bay's front door.

Figure 14. Connection to a Four Input Binary Circuit Card, P/N 506332



Note:
Binary input designations B1 through B4 as shown are for the circuit card only. The actual binary channel number depends upon the quantity of binary circuit cards installed and the location of this binary circuit card in the system network.

EIGHT INPUT BINARY CIRCUIT CARD P/N 506334 CONNECTIONS

Connections to a binary circuit card are made to terminal block TB1 located at the edge of the circuit card. Refer to "Making Connections to an LMS1000 Input/Output (I/O) Circuit Card" in this section for terminal block TB1 connection information. Refer to Figure 15 for terminal block pinouts.

Recommended wire size is 20-22 gauge. A 49.9Ω fusible resistor, located in each single ended input lead, may be used to protect

leads from unintentional shorts during installation or service. These resistors should be located as near as possible to the voltage source to provide maximum protection.

Procedure:

1. **586505000/586505500:** To access terminal block TB1 located on a binary circuit card, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100: Open the bay's front door.
2. Connect the leads as shown in Figure 15. Ensure that the jumper associated to each input is correctly set, as previously described in this section. Make connections to terminals 15 and/or 16 of each binary circuit, as required.

   Note: *A single ended connection is required for each binary input. Battery (+BAT and/or -BAT) is also connected to the circuit card as determined by the alarm wiring method used and plant polarity. This is needed only to complete the binary input path. Completion of the binary input path creates a contact closure on the binary channel. +BAT or -BAT is selected for each input by jumper placement. If all binary inputs require the same battery potential, only that potential needs to be connected to the circuit card. Refer to Figure 16 for typical binary input wiring.*
3. **586505000/586505500:** If no more connections are to be made inside the cabinet, close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet).
   or
   582140000/582140001/582126100: If no more connections are to be made inside the bay, close the bay's front door.

Figure 15. Connection to an Eight Input Binary Circuit Card, P/N 506334

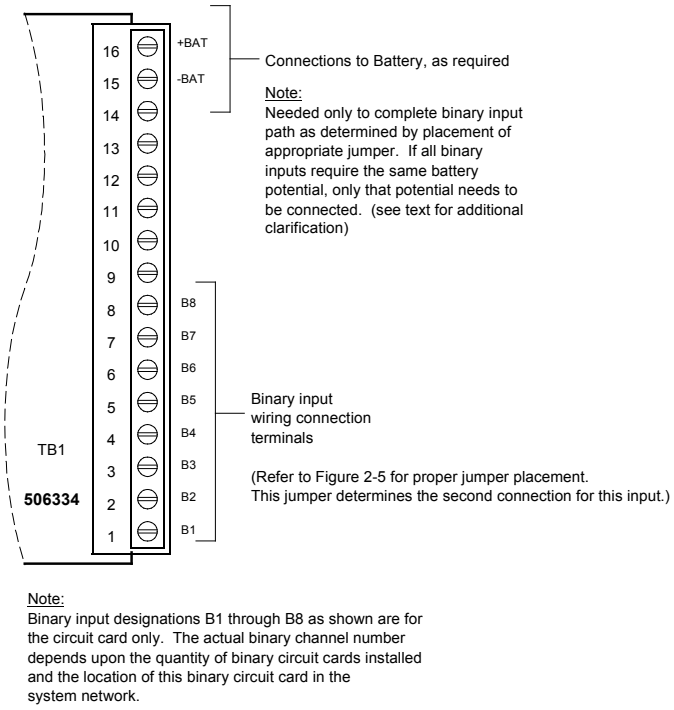
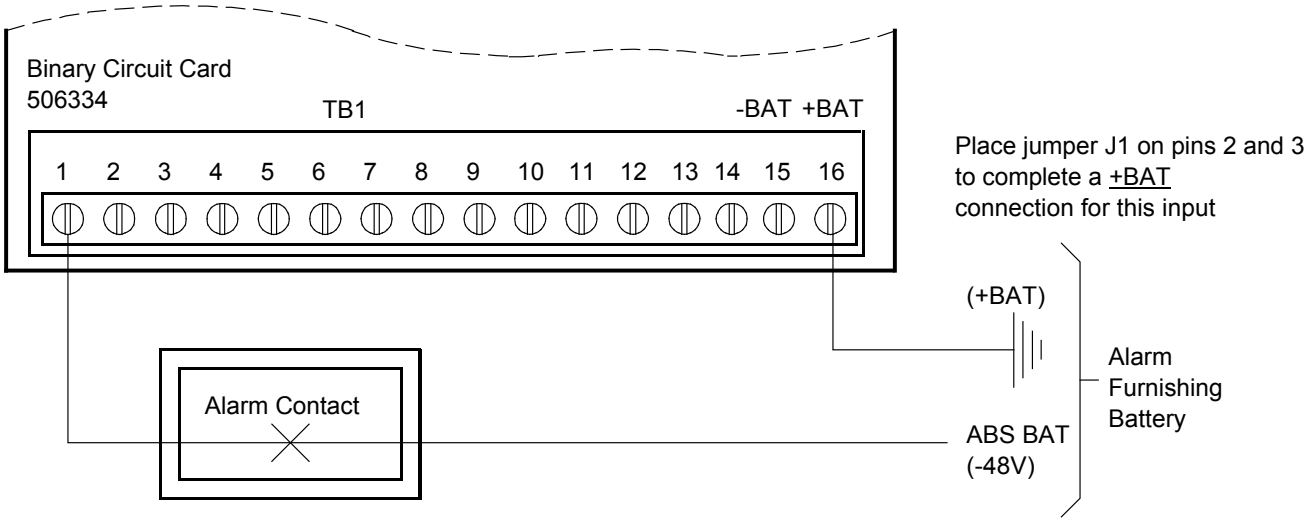


Figure 16. Typical Binary Input Wiring (cont'd on next page)

Typical Binary Input Wiring
-48V Plant



OR

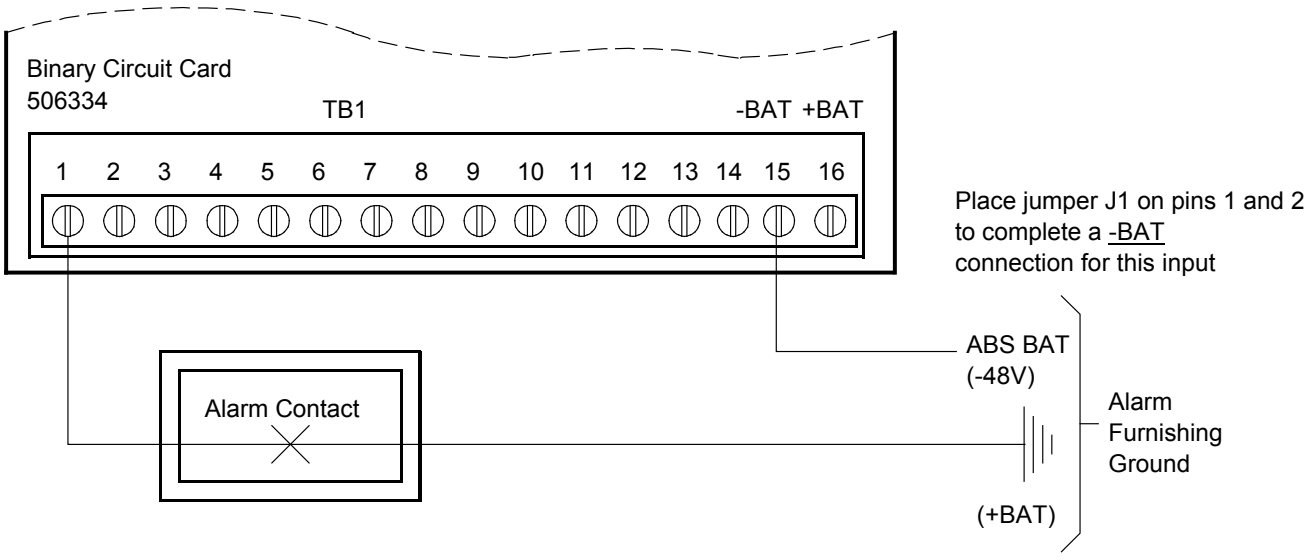


Figure 16. Typical Binary Input Wiring (cont'd from previous page, cont'd on next page)

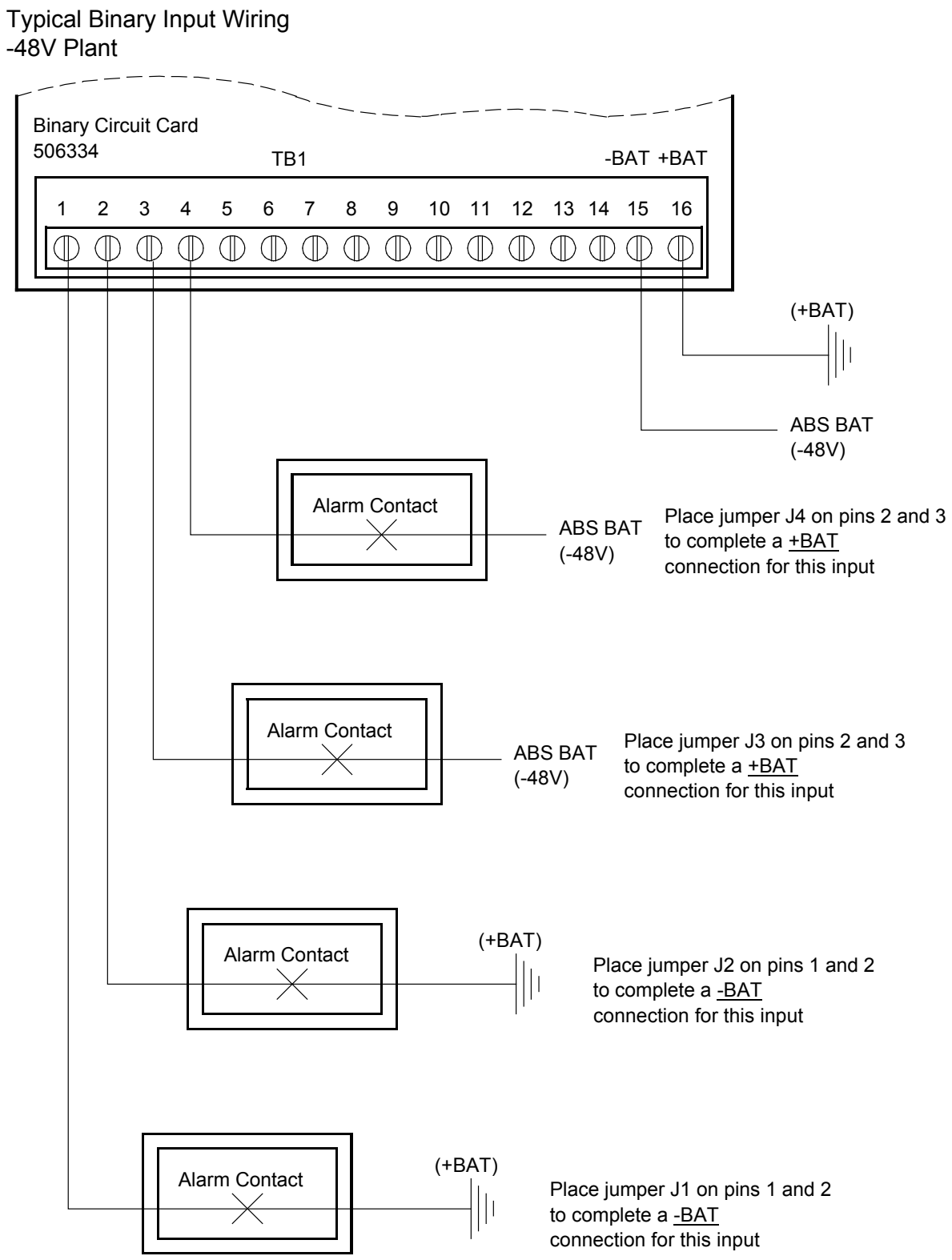


Figure 16. Typical Binary Input Wiring (cont'd from previous page, cont'd on next page)

Typical Binary Input Wiring
+24V Plant

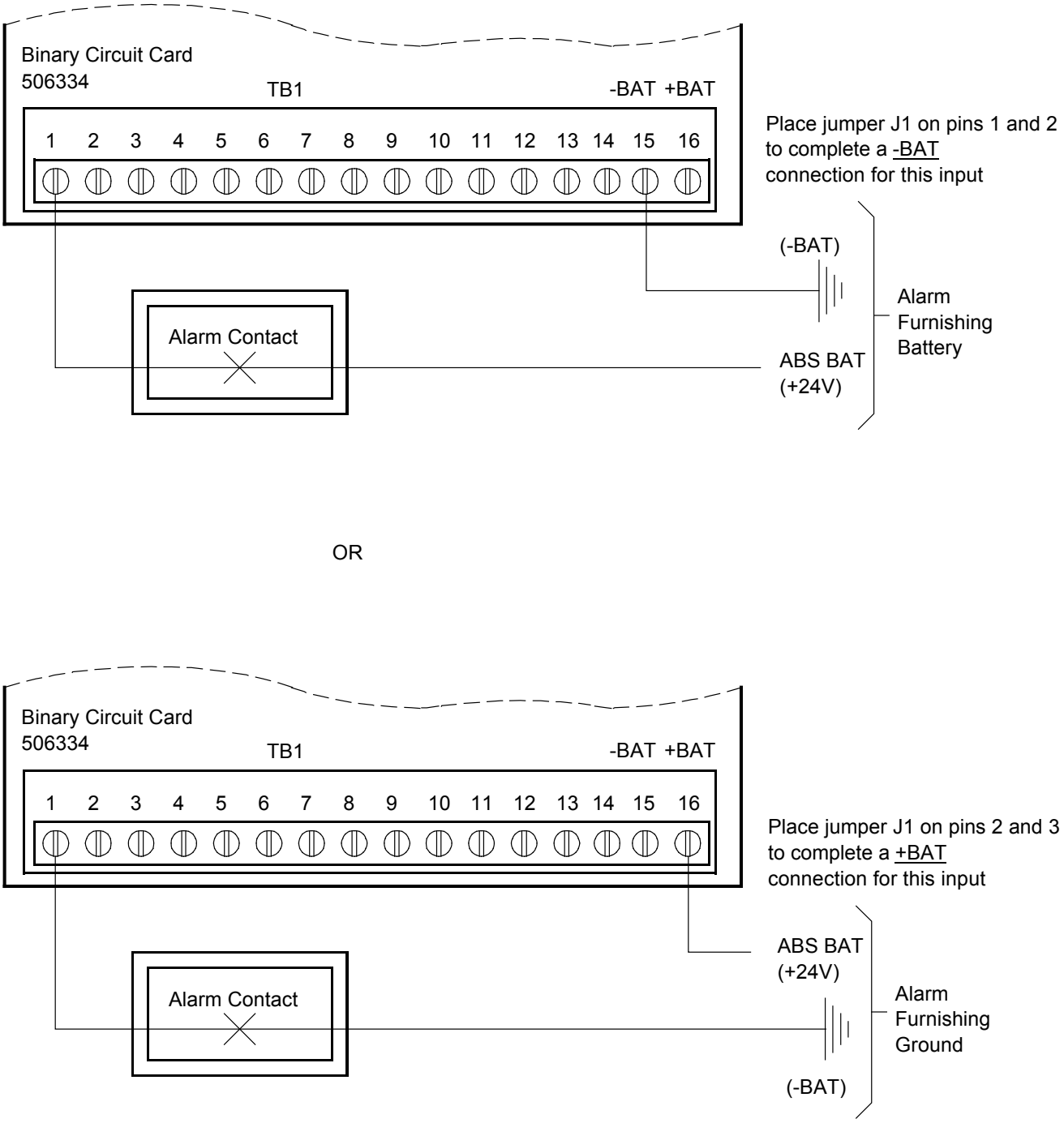
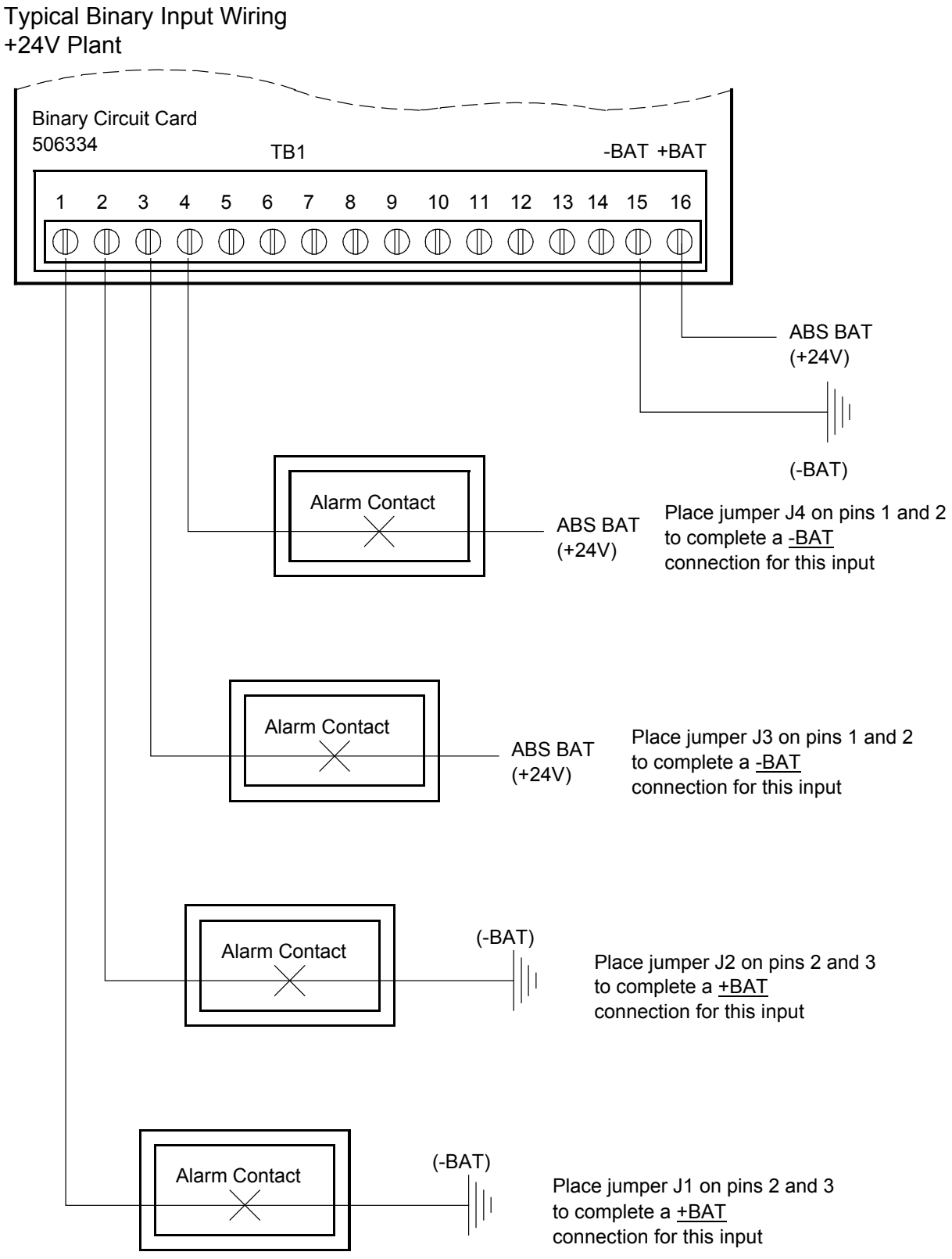


Figure 16. Typical Binary Input Wiring (cont'd from previous page)



FOUR OUTPUT (FORM-C) RELAY CIRCUIT CARD P/N 506335 CONNECTIONS

Connections to a relay circuit card are made to terminal block TB1 located at the edge of the circuit card. Refer to "Making Connections to an LMS1000 Input/Output (I/O) Circuit Card" in this section for terminal block TB1 connection information. Refer to Figure 17 for terminal block pinouts. All relays are shown released.

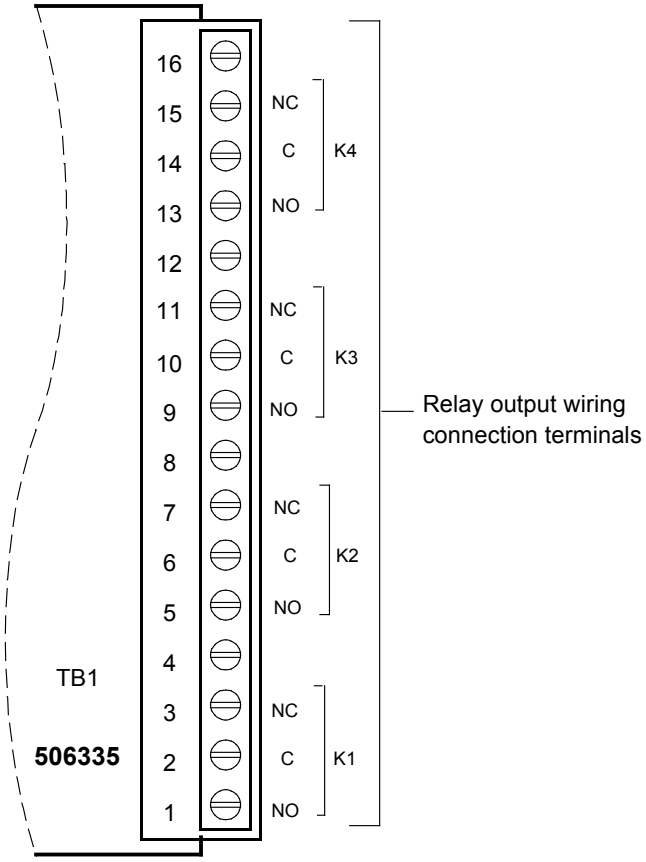
Refer to System Application Guide SAG586505000/SAG586505500 for relay contact ratings. The SAG can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Recommended wire size is 22 gauge, twisted pair wire.

Procedure:

1. **586505000/586505500:** To access terminal block TB1 located on a relay circuit card, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100: Open the bay's front door.
2. Connect the leads as shown in Figure 17.
3. **586505000/586505500:** If no more connections are to be made inside the cabinet, close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet).
   or
   582140000/582140001/582126100: If no more connections are to be made inside the bay, close the bay's front door.

Figure 17. Connection to a Four Output (Form-C) Relay Circuit Card, P/N 506335



Note:
Relay designations K1 through K4 as shown are for the circuit card only. The actual relay channel number depends upon the number of relay circuit cards installed and the location of this relay circuit card in the system network.

Relay contacts are shown with the relays deenergized.

EIGHT INPUT TEMPERATURE CIRCUIT CARD P/N 506333 CONNECTIONS

Connections to a temperature circuit card are made to terminal block TB1 located at the edge of the circuit card. Refer to "Making Connections to an LMS1000 Input/Output (I/O) Circuit Card" in this section for terminal block TB1 connection information. Refer to Figure 18 for terminal block pinouts.

Temperature probes connect to TB1 with a white (yellow) and violet (black) lead pair. Connect the white (yellow) lead to the odd numbered terminals and the violet (black) lead to the even numbered terminals.

Note: *Temperature probe lead colors are violet and white. This probe requires Temperature Circuit Card 506333 firmware version 1.1.0, or later. Previous version probe leads were black and yellow. Previous version probes are compatible with Temperature Circuit Card 506333 firmware version 1.0.1, or later.*

Note: *A firmware upgrade to Temperature Circuit Card 506333 is required when using the newer version probes with circuit cards that have firmware versions earlier than 1.1.0.*

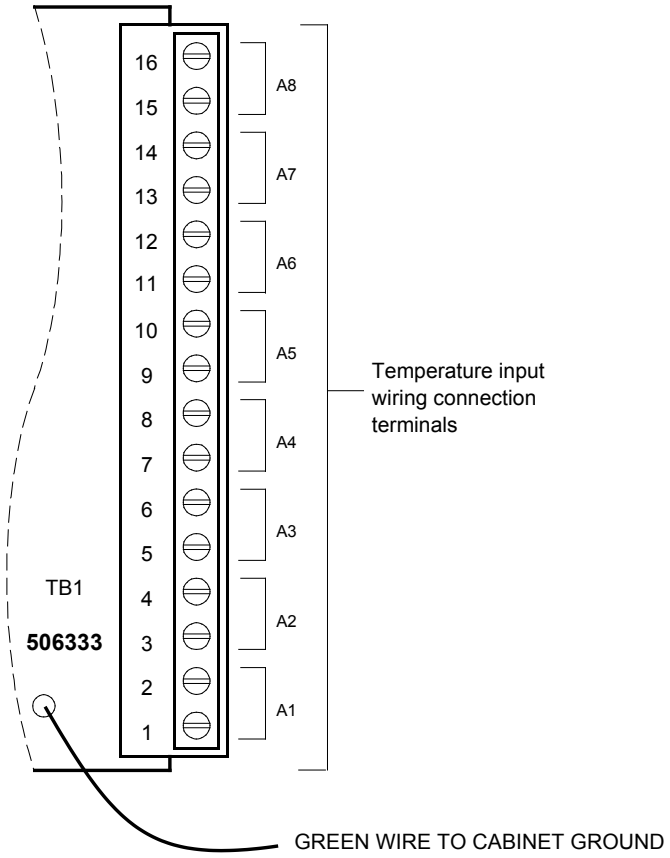
LMS1000 Temperature Probe Wire Specifications:

- **Preferred** wire is P/N 1562077, 18 Ga. solid twisted pair, maximum length is 200 feet.
- **Optional** wire is P/N 1562001, 20 Ga. shielded twisted pair (shield grounded at one end), maximum length is 100 feet.

Procedure:

1. **586505000/586505500:** To access terminal block TB1 located on a temperature circuit card, rotate the two captive fasteners on the front of the cabinet until the arrow on the fastener points up or down, and pivot the door open.
   or
   582140000/582140001/582126100: Open the bay's front door.
2. Connect the leads as shown in Figure 18. Ensure that the green wire from the circuit card is attached to cabinet ground as detailed in Figure 3.
3. **586505000/586505500:** If no more connections are to be made inside the cabinet, close the cabinet door and secure with the two captive fasteners (arrow on fastener points towards outside of cabinet).
   or
   582140000/582140001/582126100: If no more connections are to be made inside the bay, close the bay's front door.

Figure 18. Connection to an Eight Input Temperature Circuit Card, P/N 506333



Note:
Analog input designations A1 through A8 as shown are for the circuit card only. The actual analog channel number depends upon the quantity of analog and temperature circuit cards installed and location of this temperature circuit card in the system network.

Interconnecting the Optional 586505000/586505500 Expansion Assembly(s) (if furnished) to Customer Equipment

The Expansion Assembly(s) is provided with D-type connectors to interface with customer equipment. Refer to Figure 19 for connector locations and Table 8 and Table 9 for connector pinouts. Recommended wire size for monitoring leads is 22 gauge. Recommended wire size for power leads is 22 gauge. The ungrounded input power lead should be fused at 0.5 amperes.

The mating half for the D-type connectors is as specified in *SAG586505000/SAG586505500 (System Application Guide)*.

Note: *Common mode voltage between inputs must not exceed –0.15 to +0.95 volts.*

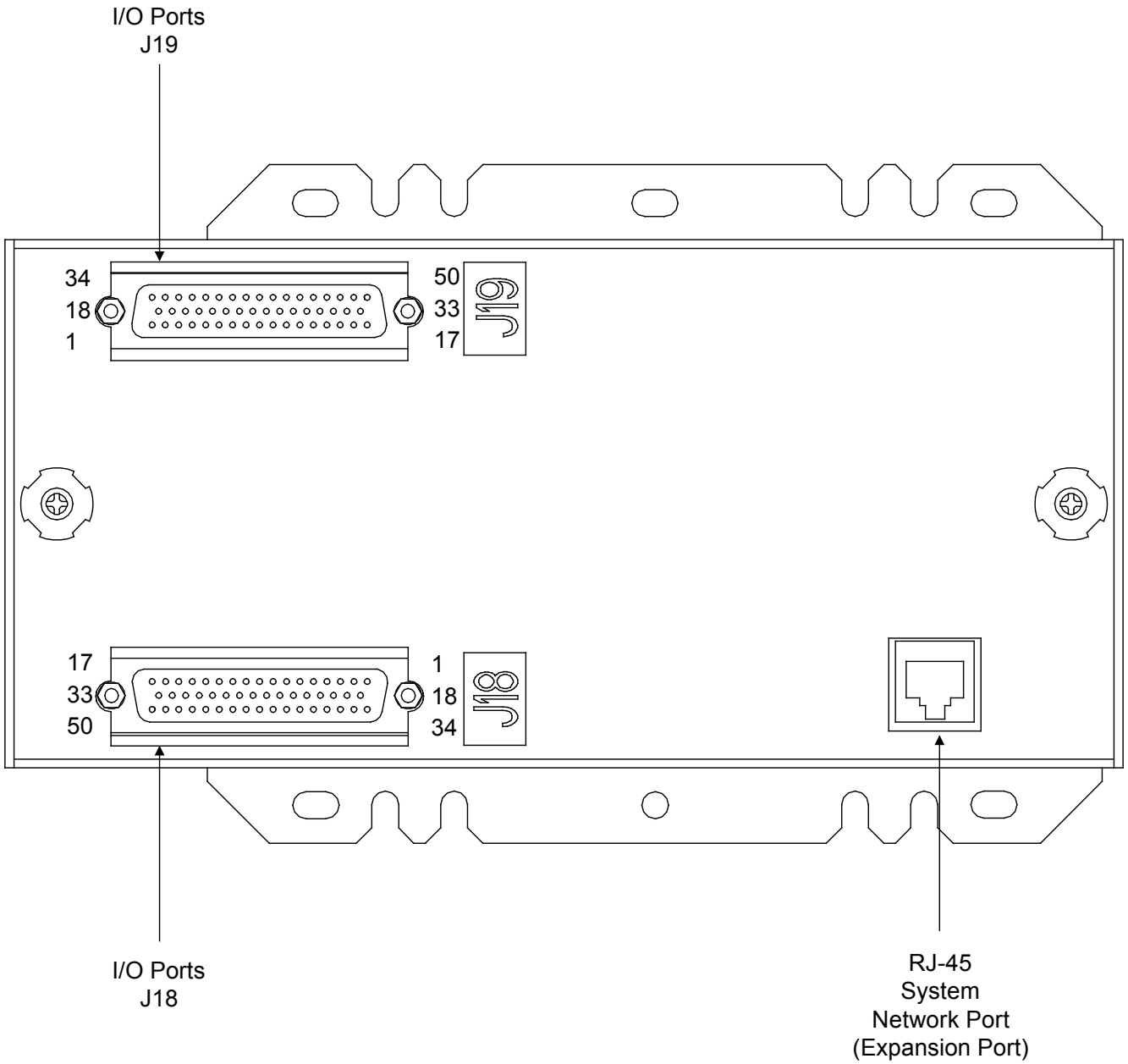
Table 8. Optional Expansion Assembly Connector Pinouts (J18)

CONNECTOR J18 PIN	FUNCTION	CONNECTOR J18 PIN	FUNCTION
1	Binary Input Channel 4	26	Shunt Input, Channel 4 (+)
2	Binary Input Channel 3	27	Shunt Input, Channel 2 (−)
3	Binary Input Channel 1	28	Shunt Input, Channel 1 (+)
4	Battery Return	29	not used
5	Battery	30	not used
6	Circuit Ground	31	not used
7	Shunt Input, Channel 8 (+)	32	not used
8	Shunt Input, Channel 6 (−)	33	not used
9	Shunt Input, Channel 5 (+)	34	Frame Ground
10	Shunt Input, Channel 3 (−)	35	Frame Ground
11	Shunt Input, Channel 2 (+)	36	Binary Input Channel 6
12	not used	37	Binary Input Channel 8
13	not used	38	not used
14	not used	39	not used
15	not used	40	not used
16	not used	41	Shunt Input, Channel 7 (−)
17	not used	42	Shunt Input, Channel 6 (+)
18	Binary Input Channel 5	43	Shunt Input, Channel 4 (−)
19	Binary Input Channel 7	44	Shunt Input, Channel 3 (+)
20	Binary Input Channel 2	45	Shunt Input, Channel 1 (−)
21	Battery Return	46	not used
22	Battery	47	not used
23	Shunt Input, Channel 8 (−)	48	not used
24	Shunt Input, Channel 7(+)	49	not used
25	Shunt Input, Channel 5 (−)	50	not used

Table 9. Optional Expansion Assembly Connector Pinouts (J19)

CONNECTOR J19 PIN	FUNCTION	CONNECTOR J19 PIN	FUNCTION
1	Shunt Input, Channel 23 (−)	26	Shunt Input, Channel 12 (+)
2	Shunt Input, Channel 22 (+)	27	Shunt Input, Channel 9 (−)
3	Shunt Input, Channel 20 (−)	28	Shunt Input, Channel 9 (+)
4	Shunt Input, Channel 19 (+)	29	not used
5	Shunt Input, Channel 17 (−)	30	not used
6	Shunt Input, Channel 17 (+)	31	not used
7	Shunt Input, Channel 15 (−)	32	not used
8	Shunt Input, Channel 14 (+)	33	not used
9	Shunt Input, Channel 12 (−)	34	Shunt Input, Channel 24 (−)
10	Shunt Input, Channel 11 (+)	35	Shunt Input, Channel 24 (+)
11	Shunt Input, Channel 10 (−)	36	Shunt Input, Channel 21 (−)
12	not used	37	Shunt Input, Channel 20 (+)
13	not used	38	Shunt Input, Channel 18 (−)
14	not used	39	Shunt Input, Channel 16 (+)
15	not used	40	Shunt Input, Channel 14 (−)
16	not used	41	Shunt Input, Channel 13 (+)
17	not used	42	Shunt Input, Channel 11 (−)
18	Shunt Input, Channel 23 (+)	43	Shunt Input, Channel 10 (+)
19	Shunt Input, Channel 22 (−)	44	not used
20	Shunt Input, Channel 21 (+)	45	not used
21	Shunt Input, Channel 19 (−)	46	not used
22	Shunt Input, Channel 18 (+)	47	not used
23	Shunt Input, Channel 16 (−)	48	not used
24	Shunt Input, Channel 15 (+)	49	not used
25	Shunt Input, Channel 13 (−)	50	not used

Figure 19. Optional Expansion Assembly Connector Locations



Interconnecting the Expansion Cabinet(s) and Assembly(s) (if furnished) into the LMS1000 Network (586505000/586505500 Only)

In a 582140000/582140001/582126100 Power System, refer to the Power System's *Installation Instructions* for LMS Network interconnections between Bays and optional LMS Expansion Assembly(s).

Located on the back of the Main and Expansion Cabinets are four RJ-45 Expansion Ports. Refer to Figure 7 for location. Located on the Expansion Assembly(s) is one RJ-45 Expansion Port. Refer to Figure 20 for location. Interconnect these ports as required for your installation so that each Expansion Cabinet and Expansion Assembly is connected to the LMS1000 Network (path from each Expansion Cabinet or Assembly can be traced back to Main Cabinet). Refer to the next section for cable specifications and assembly instructions. Refer to Figure 20 for a typical network interconnect diagram. Refer to SAG586505000/SAG586505500 for maximum cable length specifications. The SAG can be accessed via the CD (Electronic Documentation Package) furnished with your system.

LMS1000 Network Cable Specifications

LMS1000 Expansion Cabinets and Expansion Assemblies are connected to the LMS1000 Main Cabinet network with a multi-conductor cable that is terminated on both ends with a RJ-45 plug. These plugs mate with RJ-45 jacks provided throughout the LMS1000 network.

A cable with RJ-45 plugs attached to both ends may be supplied, or a length of cable with two unconnected RJ-45 plugs may be supplied, as ordered. If required, the installer is to assemble the cable per these specifications and per site requirements.

The recommended cable is a category 5, four twisted pair conductor, 24 gauge solid copper cable. Emerson Network Power P/N 156202100. Belden P/N 1585AD15. If this cable is ordered through Emerson Network Power, specify the required length in 5 feet increments. A six foot cable with appropriate plugs pre-attached is also available (P/N 421842700).
The required components necessary to terminate the cable are provided in a kit offered by Emerson Network Power. The Emerson Network Power part number of this kit is 483589500 and consist of:

a. Two (2) RJ-45 plugs. Emerson Network Power P/N 247803300. AMP P/N 557315.

LMS1000 Network Cable Assembly

Attach a plug to each end of the cable per Table 10, and the following instructions:

1. Trim and strip (0.5 – 0.56 inch) jacketed cable using appropriate, commercially available tools.

   Note: *Do not strip insulated wires.*

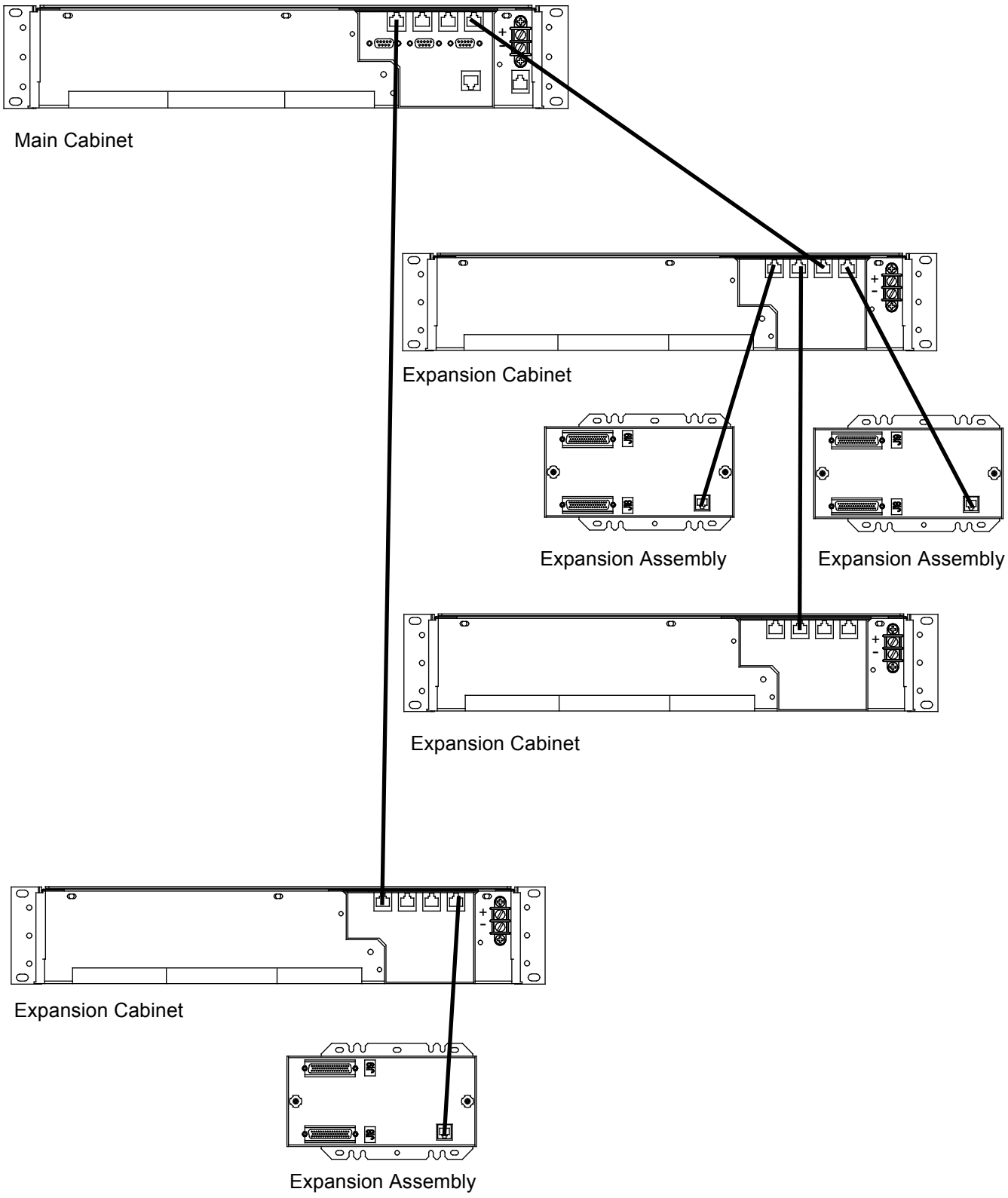
2. Insert the wires completely into the RJ-45 plug. Visually inspect the assembly to ensure proper routing of the individual conductors. If using the recommended cable, follow the color scheme shown in Table 10. Refer to Figure 9 for the pin numbering scheme of the RJ-45 plug.

3. Terminate the cable using appropriate crimp tool, AMP P/N 2-231652-1 with die set AMP P/N 853400-1.

Table 10. LMS1000 Network Cable Wire Color Scheme

PIN NO.	WIRE COLOR
1	White / Blue Stripe
2	Blue
3	White / Orange Stripe
4	Orange
5	White / Green Stripe
6	Green
7	White / Brown Stripe
8	Brown

Figure 20. Typical LMS1000 Network Interconnects



Energy Management Connections (when used w/ 'traditional' rectifiers external to the system)

Note: *The LMS1000 Energy Management and Sequencing features are not for use in Spec. Nos. 582140000, 582140001, or 582126100 Power Systems.*

Note: *When used with VPS/NPS Power Conversion Units (PCUs), **NO** customer connections are required. The following describes required connections when the LMS1000 is used with 'traditional' rectifiers external to a VPS/NPS Power System.*

Note: *Requires the Energy Management software option.*

When the LMS1000 is used with 'traditional' rectifiers, the LMS1000 requires dedicated analog, binary, and relay inputs/outputs to manage the power plant as described below. Refer also to Figure 21.

- Analog inputs connected to each rectifier's output shunt.
- Analog input connected to the plant voltage.
- Binary inputs connected to each rectifier's RFA alarm output.

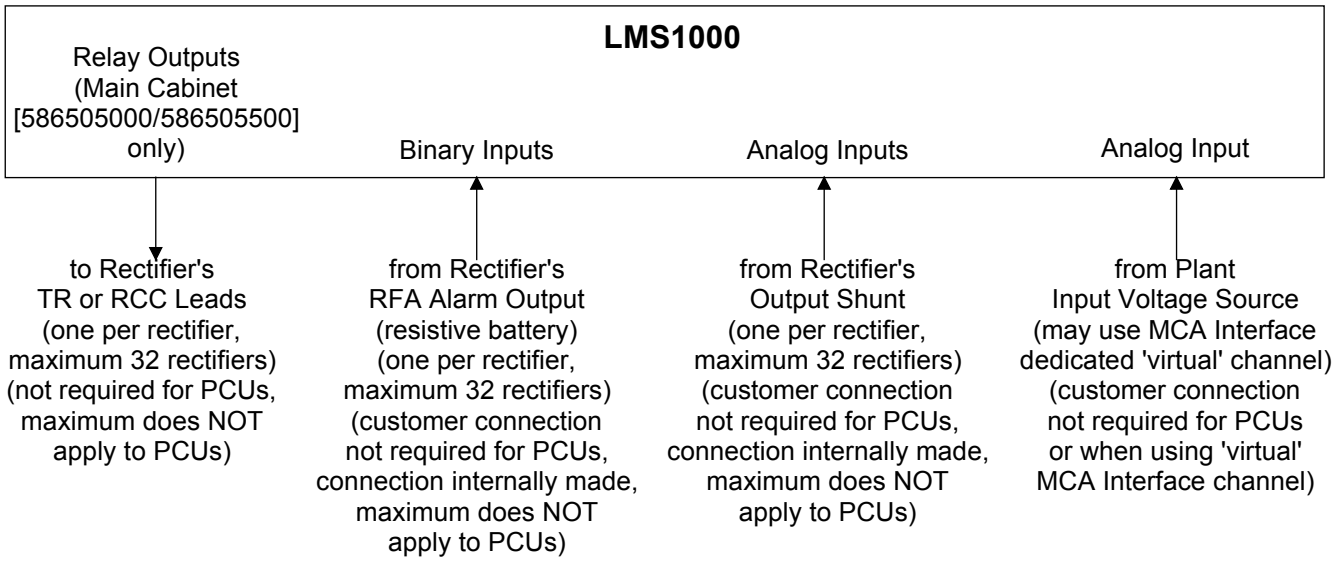
Note: *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port option, Energy Management RFA's are summed together and total number of rectifiers failures is passed to the MCA and used in determining 'Rectifier Minor' and 'Rectifier Major' alarms. This only applies to Energy Management channels not associated to Vortex/NETSURE PCU's.*

- Relay outputs connected to each rectifier and wired to turn the respective rectifier ON or OFF through its TR (RCC) leads.

Note: *Only wire to relay circuit cards installed in the 586505000/586505500 Main Cabinet. DO NOT use relay circuit cards installed in 586505000/586505500 Expansion Cabinets for controlling rectifiers.*

Note: *Relay outputs configured for programmable event control cannot be used to control a rectifier.*

Figure 21. Energy Management Option Connections when Used with 'Traditional' Rectifiers


LMS1000
Relay Outputs (Main Cabinet [586505000/586505500] only)
Binary Inputs
Analog Inputs
Analog Input
to Rectifier's TR or RCC Leads (one per rectifier, maximum 32 rectifiers) (not required for PCUs, maximum does NOT apply to PCUs)
from Rectifier's RFA Alarm Output (resistive battery) (one per rectifier, maximum 32 rectifiers) (customer connection not required for PCUs, connection internally made, maximum does NOT apply to PCUs)
from Rectifier's Output Shunt (one per rectifier, maximum 32 rectifiers) (customer connection not required for PCUs, connection internally made, maximum does NOT apply to PCUs)
from Plant Input Voltage Source (may use MCA Interface dedicated 'virtual' channel) (customer connection not required for PCUs or when using 'virtual' MCA Interface channel)

Sequential Start Connections

Note: *The LMS1000 Energy Management and Sequencing features are not for use in Spec. Nos. 582140000, 582140001, or 582126100 Power Systems.*

Note: *Requires the Sequential Start software option.*

LMS1000 requires dedicated binary and relay ('traditional rectifiers only) inputs/outputs which are connected as described below. Refer also to Figure 22.

VPS/NPS Power System's PCUS and External 'Traditional' Rectifiers

- To use the standby sequence and/or commercial AC sequence option, you must connect a dedicated binary input to a commercial AC fail or transfer circuit.
- For standby sequencing, an additional binary input must be connected to a standby on or proper operate signal.

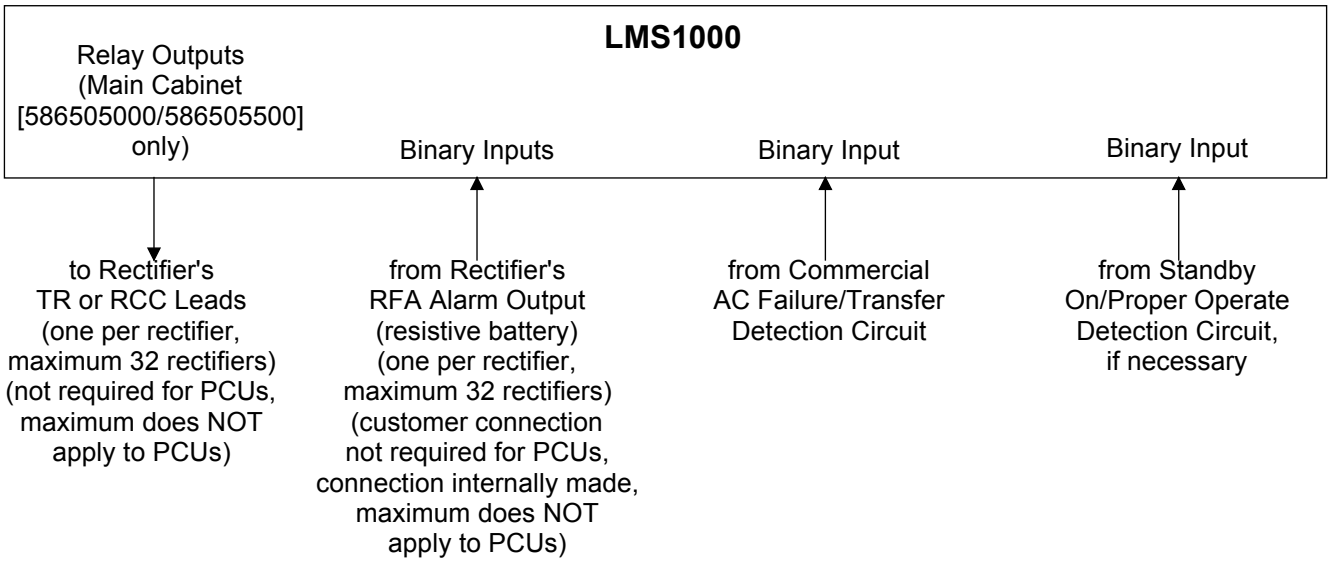
External 'Traditional' Rectifiers Only

- Binary inputs connected to each rectifier's RFA alarm output. If the rectifiers were connected to binary inputs for energy management (as described in the previous procedure), these binary inputs are also used for sequential start and no additional binary input connections are required.
- Relay outputs connected to each rectifier and wired to turn the respective rectifier ON or OFF through its TR (RCC) leads. If the rectifiers were connected to relay outputs for energy management (as described in the previous procedure), these relays are also used for sequential start and no additional relay output connections are required.

Note: *Only wire to relay circuit cards installed in the 586505000/586505500 Main Cabinet. DO NOT use relay circuit cards installed in 586505000/586505500 Expansion Cabinets for controlling rectifiers.*

Note: *Relay outputs configured for programmable event control cannot be used to control a rectifier.*

Figure 22. Sequential Start Option Connections


LMS1000
Relay Outputs (Main Cabinet [586505000/586505500] only)
Binary Inputs
Binary Input
Binary Input
to Rectifier's TR or RCC Leads (one per rectifier, maximum 32 rectifiers) (not required for PCUs, maximum does NOT apply to PCUs)
from Rectifier's RFA Alarm Output (resistive battery) (one per rectifier, maximum 32 rectifiers) (customer connection not required for PCUs, connection internally made, maximum does NOT apply to PCUs)
from Commercial AC Failure/Transfer Detection Circuit
from Standby On/Proper Operate Detection Circuit, if necessary

LMS Dual MCA Interface Software Option

Refer to the LMS documentation (especially Section 5847) for description, configuration, and operation of the LMS Dual MCA Interface feature. Refer to Spec. Nos. 582140000, 582140001, or 582126100 Power System documentation for system interconnections information.

Powering Up and Checking System Operation

Initial Startup Preparation

Ensure that all blocks (except the last block) in the "Installation Acceptance Checklist", located at the beginning of this document, have been checked.

This procedure requires a terminal to be connected to the system, either locally or remotely, as described in this section.

If a local terminal is used, the communications parameters must be initially set for 19200 bits/s, 8 data bits, 1 stop bit, and no parity.

If a remote terminal is used, the communications parameters must be initially set for 8 data bits, 1 stop bit, and no parity.

Powering Up the System

This procedure verifies the correct status and operation of all indicators after power is first applied. These indicators are located on the LMS1000 CPU circuit cards. In a 586505000/586505500 LMS1000 System, these indicators are visible through the front panel of the Main and Expansion Cabinets. In the 582140000/582140001/582126100 Power System, open the bay's front door to view the indicators on the LMS CPU circuit card.

PROCEDURE:

1. Apply DC input power to the system by closing the external fuse(s) or circuit breaker(s) which supplies power to each component of the LMS1000 system.
2. Verify that the ON indicator is illuminated green (on the Main LMS1000 CPU circuit card, and each LMS1000 Expansion CPU circuit card).
3. Verify that the FAIL indicator is not illuminated (on the Main LMS1000 CPU circuit card, and each LMS1000 Expansion CPU circuit card).
4. Verify that the programmable status LED indicators are extinguished (on the Main LMS1000 CPU circuit card only).

Logging Onto the System

Note: *For WEB Interface, refer to the OPERATING section in the User Instructions (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

PROCEDURE:

If using a local terminal, press the ***ENTER*** key.

If communicating through a modem, the user must call the system and wait for it to answer. A remote communication link is automatically established after the modem connects.

For a Telnet session, simply connect to the system.

1. When the communication link is established, the system prompts the user to ...

   ```
   ENTER PASSWORD
   *
   ```

2. The system has asked for a password. As shipped, the password for each command access level of the system is the same number as the level of access requested. Therefore, the password for level 1 is 1, level 2 is 2, etc. In this procedure, the password (command access level) that is required is 6. Type ***6***, then press ***ENTER***. The character 6 will not appear on the screen as it is typed.
3. The system responds with the command prompt ...

   ```
   Command <6>:
   ```

4. The user is now logged onto the system.

586505000/586505500 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay I/O Circuit Card Verification

This procedure verifies correct installation of the I/O circuit cards in the 586505000/586505500 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay, and confirms that the CPU circuit card is communicating with these circuit cards.

Note: *I/O circuit cards installed in 586505000/586505500 Expansion Cabinets or 582140000/582140001/582126100 Secondary Bays and the I/O circuits in optional 586505000/586505500 Expansion Assemblies are displayed as unmapped nodes in an order based on serial#, spec#, and cabinet location parameters until these Nodes are established in the LMS1000 Network. This is covered in the System Configuration section.*

PROCEDURE:

1. Type ***BOARDS***, then press ***ENTER***.

   ```
   Command <6>:  BOARDS
   ```

2. The system displays a list of circuit cards installed in the 586505000/586505500 Main Cabinet or LMS1000 cards installed in the 582140000/582140001/582126100 Primary Power Bay. Check this list to verify that the type and number of the circuit cards identified match the ones installed.
3. If circuit cards are not correctly listed, the user should check to be sure each circuit card is seated properly in the cabinet or bay mounting connector.

Software Option Verification

This procedure verifies that the required software options are installed.

PROCEDURE:

1. Type ***OPTIONS***, then press ***ENTER***.

   ```
   Command <6>:  OPTIONS
   ```

2. The system displays a list of all available software options, and indicates which ones are installed. Check this list to verify that the required software options are installed.

   Note: *Also listed are the LMS1000 communications ports associated with each installed option, if applicable.*

Verifying Programmable Status LED Indicator Operation

This procedure verifies correct operation of the programmable status LED indicators.

PROCEDURE:

1. Type ***SET LED***, then press ***ENTER***.

   ```
   Command <6>: SET LED
   ```

2. The system responds with ...

   ```
   Set LED:
   ```

3. Type ***1***, then press ***ENTER***.
4. Verify that LED indicator 1 located on the main LMS1000 CPU circuit card illuminates.
5. Type ***CLR LED***, then press ***ENTER***.

   ```
   Command <6>: CLR LED
   ```

6. The system responds with ...

   ```
   Clear LED:
   ```

7. Type ***1***, then press ***ENTER***.
8. Verify that LED indicator 1 extinguishes.
9. Repeat Steps 1) through 8) entering the numbers, one at a time, ***2*** through ***8***. Verify that the associated LED indicator illuminates and extinguishes as described above.

Verifying Relay Operation

This procedure verifies correct operation of the relay circuit cards installed in the 586505000/586505500 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay, if provided.

CAUTION! DO NOT perform this procedure on any relay channel that controls an entity that could cause a service interruption.

Note: *The relay circuit card contains a jumper which may be set to disable the use of the SET RLY and CLR RLY commands.*

Note: *Relay circuit cards installed in 586505000/586505500 Expansion Cabinets or 582140000/582140001/582126100 Secondary Bays cannot be tested until the Expansion Cabinet or Secondary Bay Node is established in the LMS1000 Network. This is covered in the System Configuration section.*

PROCEDURE:

1. Type ***SET RLY***, then press ***ENTER***.

   ```
   Command <6>: SET RLY
   ```

2. The system responds with ...

   ```
   Set Relay:
   ```

3. Type ***1***, then press ***ENTER***.
4. Verify that the external circuit connected to the relay output associated to this relay channel performs as expected.
5. Type ***CLR RLY***, then press ***ENTER***.

   ```
   Command <6>: CLR RLY
   ```

6. The system responds with ...

   ```
   Clear Relay:
   ```

7. Type ***1***, then press ***ENTER***.
8. Verify that the external circuit connected to the relay output associated to this relay channel performs as expected.
9. Repeat Steps 1) through 8) entering the numbers, one at a time, ***2*** through ***32***, as required. Verify that the external circuits connected to the relay outputs associated to these relay channels perform as expected.

Logging Off of the System

This procedure shows the user how to terminate the current communication session.

PROCEDURE:

1. Type ***BYE***, then press ***ENTER***.

   ```
   Command <6>: BYE
   ```

2. The screen displays a user logged off response.

Configuring the System

The system requires configuration information to be entered, refer to "Configuring LMS1000".

Installation Logs/Worksheets

Refer to the following tables.

LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES* **DATE**

ANALOG CHANNEL CONFIGURATION INFORMATION FOR NODE # (Main Cabinet Node 00, or Expansion Cabinet Node _____, or Expansion Assembly Node _____) (cont'd on next page)												Wired to Input #	of Analog or Temperature Circuit Card Installed in Shelf Position #
Analog Channel Number (Input)	Wired To (Channel Name)	System Alarm Reporting (Y or N)	Transducer Type (Shunt, Current, Voltage, Temp, or None)	If "Shunt" Selected, Shunt type (50mv or 100mv)	If "Current" Selected, 4-20 mA Signal (Y or N)	If "Voltage" Selected, Full Scale Output (in volts)	If "Shunt", "Current", "Voltage" or "None" Selected, Scale Factor	Alarm Polarity (+, -, P)	Unit Text	Off Delay	On Delay		
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NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details. Additional Worksheets are provided for TL1 Software Option Channel Attributes.

LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES* **DATE**

ANALOG CHANNEL CONFIGURATION INFORMATION FOR NODE # (Main Cabinet Node 00, or Expansion Cabinet Node _____, or Expansion Assembly Node _____) (cont'd from previous page)																	Wired to Input #	of Analog or Temperature Circuit Card Installed in Shelf Position #
Analog Channel Number (Input)	Alarm Limit 1 Enabled (Y or N)	Alarm Limit 1 (Value and H or L)	Alarm Limit 1 Name	Alarm Limit 1 Alarm Class No.	Alarm Limit 2 Enabled (Y or N)	Alarm Limit 2 (Value and H or L)	Alarm Limit 2 Name	Alarm Limit 2 Alarm Class No.	Alarm Limit 3 Enabled (Y or N)	Alarm Limit 3 (Value and H or L)	Alarm Limit 3 Name	Alarm Limit 3 Alarm Class No.	Alarm Limit 4 Enabled (Y or N)	Alarm Limit 4 (Value and H or L)	Alarm Limit 4 Name	Alarm Limit 4 Alarm Class No.		
A																		
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NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details. Additional Worksheets are provided for TL1 Software Option Channel Attributes.

LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES* **DATE**

BINARY CHANNEL CONFIGURATION INFORMATION FOR NODE # (Main Cabinet Node 00, or Expansion Cabinet Node _____, or Expansion Assembly Node _____)							Wired to Input #	of Binary Circuit Card Installed in Shelf Position #
Binary Channel Number (Input)	Wired To (Channel Name)	System Alarm Reporting (Y or N)	Alarm Condition (CC or CO)	Off Delay	On Delay	Alarm Class No.		
B								
B								
B								
B								
B								
B								
B								
B								
B								
B								
B								
B								
B								
B								
B								
B								

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details. Additional Worksheets are provided for TL1 Software Option Channel Attributes.

LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES*

DATE

FUNCTION CHANNEL CONFIGURATION INFORMATION FOR NODE 00 (Main Cabinet) (cont'd on next page)

Function Channel Number (Input)	Channel Name	System Alarm Reporting (Y or N)	Unit Text	Off Delay	On Delay	Program Line
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =
F00						F00 =

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LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES* **DATE**

FUNCTION CHANNEL CONFIGURATION INFORMATION FOR NODE 00 (Main Cabinet) (cont'd from previous page)																
Function Channel Number (Input)	Alarm Limit 1 Enabled (Y or N)	Alarm Limit 1 (Value and H or L)	Alarm Limit 1 Name	Alarm Limit 1 Alarm Class No.	Alarm Limit 2 Enabled (Y or N)	Alarm Limit 2 (Value and H or L)	Alarm Limit 2 Name	Alarm Limit 2 Alarm Class No.	Alarm Limit 3 Enabled (Y or N)	Alarm Limit 3 (Value and H or L)	Alarm Limit 3 Name	Alarm Limit 3 Alarm Class No.	Alarm Limit 4 Enabled (Y or N)	Alarm Limit 4 (Value and H or L)	Alarm Limit 4 Name	Alarm Limit 4 Alarm Class No.
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																
F00																

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

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LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES*

DATE

RELAY CHANNEL CONFIGURATION INFORMATION FOR NODE # (Main Cabinet Node 00 or Expansion Cabinet Node _____) (RELAY CHANNELS NOT ASSOCIATED TO AN ENERGY MANAGEMENT CHANNEL ONLY)												
Relay Channel Number (Output)	Wired To (Channel Name)	Alarm Type (Y or N)	System Alarm Reporting (Y or N)	Alarm Class No.	Affected by ACO (Y or N)	Cycle Frequency	Off Delay	On Delay	Program Line		Wired to Output #	of Relay Circuit Card Installed in Shelf Position #
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			
R									R =			

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details. Additional Worksheets are provided for TL1 Software Option Channel Attributes.

LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES* **DATE**

RELAY CHANNEL CONFIGURATION INFORMATION FOR NODE 00 (Main Cabinet) RELAY CHANNELS ASSOCIATED TO AN ENERGY MANAGEMENT CHANNEL ONLY		Wired to Output #	of Relay Circuit Card Installed in Shelf Position #
Relay Channel Number (Output)	Wired to Rectifier No. ? or Name ? (Channel Name for Energy Management and/or Sequential Start) Enter this information also in the Energy Management Log (Worksheet)		
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			
R00			

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

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LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES* **DATE**

LED CHANNEL CONFIGURATION INFORMATION FOR NODE 00 (Main Cabinet)								
LED Channel Number (Output)	**Channel Name**	**Color (Red, Amber, or Green)**	**Alarm Type (Y or N)**	**System Alarm Reporting (Y or N)**	**Alarm Class No.**	**Off Delay**	**On Delay**	**Program Line**
L0001 (DS1)								L0001=
L0002 (DS2)								L0002=
L0003 (DS3)								L0003=
L0004 (DS4)								L0004=
L0005 (DS5)								L0005=
L0006 (DS6)								L0006=
L0007 (DS7)								L0007=
L0008 (DS8)								L0008=

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details. Additional Worksheets are provided for TL1 Software Option Channel Attributes.

LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES* **DATE**

ENERGY MANAGEMENT CHANNEL CONFIGURATION INFORMATION							Number of Binary Channel Connected to Plant Input Voltage Source
Energy Management Channel Number (Output)	Controlling Rectifier No. ? or Name ? (Channel Name)	Rectifier Full Load Capacity	Number of Analog Channel Connected to Rectifier Input Shunt	Number of Binary Channel Connected to Rectifier Fail Alarm (RFA)	Number of Relay Channel Connected to Rectifier TR or RCC leads	Rectifier On when Diesel On (Y or N)	
E00							
E00							
E00							
E00							
E00							
E00							
E00							
E00							
E00							
E00							
E00							
E00							
E00							
E00							
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E00							
E00							
E00							
E00							
E00							
E00							

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

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LMS1000 INSTALLATION LOG/WORKSHEET FOR CHANNEL ATTRIBUTES*

DATE

RECTIFIER SEQUENTIAL START CONFIGURATION INFORMATION		Standby Sequencer (Y or N)	Number of Binary Channel, if required, Connected to Standby On/Proper Operate Circuit (Set To Alarm when Standby Starts)	Standby Start Delay	AC Sequencer (Y or N)	Number of Binary Channel, if required, Connected to AC Fail/Transfer Circuit (Set To Alarm when AC Fails)	Input Type (FAIL or TRANSFER)
Sequential Start for Rectifier No.	Number of Relay Channel Connected to Rectifier TR or RCC leads						

LMS1000 INSTALLATION LOG/WORKSHEET FOR TL1 SOFTWARE OPTION CHANNEL ATTRIBUTES* DATE

ANALOG CHANNEL CONFIGURATION INFORMATION FOR NODE # (Main Cabinet Node 00, or Expansion Cabinet Node _____, or Expansion Assembly Node _____) (cont'd on next page)												
Analog Channel Number (Input)	Wired To (Sub-Access Identifier)	Monitor Type and Monitor Value Format	Alarm Limit 1 Notifi-cation Code	Alarm Limit 1 Service Effect Code	Alarm Limit 1 Condition Type	Alarm Limit 1 Condition Description	Alarm Limit 2 Notifi-cation Code	Alarm Limit 2 Service Effect Code	Alarm Limit 2 Condition Type	Alarm Limit 2 Condition Description	Wired to Input #	of Analog or Temperature Circuit Card Installed in Shelf Position #
A												
A												
A												
A												
A												
A												
A												
A												
A												
A												
A												
A												
A												
A												
A												
A												

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details.

LMS1000 INSTALLATION LOG/WORKSHEET FOR TL1 SOFTWARE OPTION CHANNEL ATTRIBUTES* **DATE**

ANALOG CHANNEL CONFIGURATION INFORMATION FOR NODE # (Main Cabinet Node 00, or Expansion Cabinet Node _____, or Expansion Assembly Node _____) (cont'd from previous page)									Wired to Input #	of Analog or Temperature Circuit Card Installed in Shelf Position #
Analog Channel Number (Input)	Alarm Limit 3 Notifi-cation Code	Alarm Limit 3 Service Effect Code	Alarm Limit 3 Condition Type	Alarm Limit 3 Condition Description	Alarm Limit 4 Notifi-cation Code	Alarm Limit 4 Service Effect Code	Alarm Limit 4 Condition Type	Alarm Limit 4 Condition Description		
A										
A										
A										
A										
A										
A										
A										
A										
A										
A										
A										
A										
A										
A										
A										
A										

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

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LMS1000 INSTALLATION LOG/WORKSHEET FOR TL1 SOFTWARE OPTION CHANNEL ATTRIBUTES*

DATE

BINARY CHANNEL CONFIGURATION INFORMATION FOR NODE # (Main Cabinet Node 00, or Expansion Cabinet Node _____, or Expansion Assembly Node _____)						Wired to Input #	of Binary Circuit Card Installed in Shelf Position #
Binary Channel Number (Input)	Wired To (Sub-Access Identifier)	Condition Type	Condition Description	Notification Code	Service Effect Code		
B							
B							
B							
B							
B							
B							
B							
B							
B							
B							
B							
B							
B							
B							
B							
B							

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details.

LMS1000 INSTALLATION LOG/WORKSHEET FOR TL1 SOFTWARE OPTION CHANNEL ATTRIBUTES* DATE

FUNCTION CHANNEL CONFIGURATION INFORMATION FOR NODE 00 (Main Cabinet) (cont'd on next page)

Function Channel Number (Input)	Sub-Access Identifier	Monitor Type and Monitor Value Format	Alarm Limit 1 Notification Code	Alarm Limit 1 Service Effect Code	Alarm Limit 1 Condition Type	Alarm Limit 1 Condition Description	Alarm Limit 2 Notification Code	Alarm Limit 2 Service Effect Code	Alarm Limit 2 Condition Type	Alarm Limit 2 Condition Description
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										
F00										

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details.

LMS1000 INSTALLATION LOG/WORKSHEET FOR TL1 SOFTWARE OPTION CHANNEL ATTRIBUTES* DATE

FUNCTION CHANNEL CONFIGURATION INFORMATION FOR NODE 00 (Main Cabinet) (cont'd from previous page)								
Function Channel Number (Input)	Alarm Limit 3 Notifi-cation Code	Alarm Limit 3 Service Effect Code	Alarm Limit 3 Condition Type	Alarm Limit 3 Condition Description	Alarm Limit 4 Notifi-cation Code	Alarm Limit 4 Service Effect Code	Alarm Limit 4 Condition Type	Alarm Limit 4 Condition Description
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								
F00								

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

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LMS1000 INSTALLATION LOG/WORKSHEET FOR TL1 SOFTWARE OPTION CHANNEL ATTRIBUTES*

DATE

RELAY CHANNEL CONFIGURATION INFORMATION FOR NODE # (Main Cabinet Node 00 or Expansion Cabinet Node _____)

Relay Channel Number (Output)	Wired To (Sub-Access Identifier)	Condition Type	Condition Description	Notification Code	Service Effect Code	Control Type	Wired to Output #	of Relay Circuit Card Installed in Shelf Position #
R								
R								
R								
R								
R								
R								
R								
R								
R								
R								
R								
R								
R								
R								
R								
R								

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details.

LMS1000 INSTALLATION LOG/WORKSHEET FOR TL1 SOFTWARE OPTION CHANNEL ATTRIBUTES*

DATE

LED CHANNEL CONFIGURATION INFORMATION FOR NODE 00 (Main Cabinet)

LED Channel Number (Output)	Sub-Access Identifier	Condition Type	Condition Description	Notification Code	Service Effect Code	Control Type
L0001 (DS1)						
L0002 (DS2)						
L0003 (DS3)						y
L0004 (DS4)						
L0005 (DS5)						
L0006 (DS6)						
L0007 (DS7)						
L0008 (DS8)						

NOTE: *This log (worksheet) may be reproduced as necessary to record and document system wiring and programming.*

* Refer to the CONFIGURATION section in this manual for details.

Configuring LMS1000

Getting Started

This section requires you to have an understanding of the general operation of the system. Specifically, you must:

- know how to access the system using a local or remote terminal.
- have an understanding of the conventions used in accessing the system.
- have an understanding of the conventions used in an SNMP interface.

For an explanation of the first two topics, including terminal requirements, refer to "Operating LMS1000" in the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Operation of the SNMP interface is beyond the scope of this manual. Refer to other documentation for SNMP interface information, such as the following...

Relevant RFC's

1901	Introduction to Community-based SNMPv2.
1902	Structure of Management Information for Version 2 of the Simple Network Management Protocol (SNMPv2).
1903	Textual Conventions for Version 2 of the Simple Network Management Protocol (SNMPv2).
1904	Conformance Statements for Version 2 of the Simple Network Management Protocol (SNMPv2).
1905	Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2).
1906	Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2).
1907	Management Information Base for Version 2 of the Simple Network Management Protocol (SNMPv2).

Books

SNMP SNMPv2 and RMON
Practical Network Management
Second Edition
by William Stallings
SNMP
A Guide to Network Management
by Dr. Sidnie Feit

Required Password

By default, USERS 1 through 6 are programmed with the PASSWORD 1 through 6 (respectively) and COMMAND ACCESS LEVEL 1 through 6 (respectively). Thus, the default password for each command access level of the system is the same number as the level of access requested. Therefore, the password for level 1 is 1, level 2 is 2, etc. In the following procedures, the password (command access level) that is required when logging onto the system is 6. If the system has been previously configured, a user that has level 6 access is required to perform the following procedures.

What Can Be Changed

The following parameters can be changed by using the commands listed (procedures provided in the INITIAL CONFIGURATION section of this section). Refer to “Commands" in the *User Instructions* (Section 5847) for typical screen displays. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Note: *After initial programming, various features of the system initially programmed using the SET SYSTEM command can be re-programmed separately. Procedures provided in the SUBSEQUENT CONFIGURATION section of this section.*

SET COM Command: Sets local port data rate.

SET SYSTEM Command: Sets the following...

Date
Time
Unit Name
Unit Number
System Identifier
Unit Header
Unit Pager Code
Pager Delay
Alarm Class Names
Expansion Node Configurations
Analog Channel Configurations
Binary Channel Configurations
Energy Management Channel Configurations
Function Channel Configurations
LED Channel Configurations
Relay Channel Configurations
Number of Rings before Answering
User Configurations
System Alarm Reporting

CONFIG G(group) Command: Organizes channels into groups.

SET TIMEOUT Command: Sets User Timeout Period.

IP ADDRESS Command: Sets the unit’s IP address.

IP HOST Command: Adds a new host to the list of authorized hosts.

IP GATEWAY Command: Sets the unit’s gateway address.

IP NETMASK Command: Sets the unit’s network netmask.

SNMP GET Command: Sets the SNMP "get" community name..

SNMP SET Command: Sets the SNMP "set" community name.

TRAPS COMMUNITY Command: Sets the SNMP “traps” community name.

TRAPS ADD Command: Adds a new SNMP Trap recipient to the list of TRAP hosts.

TRAPS VERSION Command: Change the version of SNMP TRAPS sent by the system.

TRAPS OCCURRED Command: Disable/Enable the systems ability to send SNMP Occurred Alarm TRAPS.

TRAPS PERSISTENT Command: Disable/Enable the systems ability to send SNMP Persistent Alarm TRAPS or set the Persistent Alarm TRAPS reporting interval.

TRAPS RETIRED Command: Disable/Enable the systems ability to send SNMP Retired Alarm TRAPS.

SET EFF Command: Sets Energy Management (if installed)

SET SEQUENCE Command: Sets Sequential Start (if installed)

SET MODE Command: Sets TL1 port parameters (if installed).

SET AID Command: Sets Access Identifiers (if TL1 installed)

SET EMAIL Command: Sets the Email parameters for System Alarm Reports and User Reports.

Descriptions of Configuration Attributes

Unit Identification

Unit Name (30 characters maximum): The name displayed after a user logs onto the system and when an alarm report is issued to a remote terminal.

Unit Number (4 digits maximum): The number displayed after a user logs onto the system and when an alarm report is issued to a remote terminal.

Unit TCP/IP Address: In the format of nnn.nnn.nnn.nnn, where 0 ≤ nnn ≤ 255. An IP address is a unique identifying number that your computer uses during its time on the internet. Traffic coming from you or going to you is routed based on your IP address, which identifies the unique machine you are on and its place in the internet. For instance, 198.147.241.20 is the IP address of host whitehouse.gov. All packets on the internet destined for whitehouse.gov are sent to this IP address by the Domain Name Service. All traffic coming from this host is identified as such because the packets contain the originating IP address in the packet headers. All routing and traffic on the internet ultimately depends on IP addresses.

System Identifier (20 characters maximum): This parameter applies only to TL1 commands/messages. This is a unique name which identifies the LMS1000 in an NMA system. This data parameter is used to identify the destination of command messages and the source of response and autonomous messages in an NMA system.

Unit Header (79 characters maximum): The description displayed after a user logs onto the system and when an alarm report is issued to a remote terminal. It is intended for storing such information as office drawing numbers, emergency phone numbers, etc.

Unit Pager Code: The number which appears in the display window of the paging system beeper unit.

Pager Delay (0-99 seconds): Determines the time delay in seconds between the last digit dialed in a pager phone number and outputting the pager PIN number.

GET Community String

String of alpha/numeric characters.

Description: An SNMP community is a relationship between an SNMP agent and a set of SNMP managers that defines authentication, access control, and proxy characteristics. The community concept is a local one, defined at the managed system. The managed system establishes one community for each desired combination of authentication, access control, and proxy characteristics. Each community is given a community name, and the management stations.

The GET community name to authenticate GET and GETNEXT requests. The SET community name to authenticate SET requests.

TRAPS Community String

String of alpha/numeric characters.

Description: See description in GET Community String above.

The TRAPS community name authenticates TRAP messages to the SNMP managers.

SET Community String

String of alpha/numeric characters.

Description: See description in GET above.

TRAP Addresses

In the format of nnn.nnn.nnn.nnn, where 0 ≤ nnn ≤ 255.

Description: A list of IP addresses to which SNMP Traps will be sent. The machine with this IP address must have appropriate SNMP browser running. SNMP Traps V1 or V2 can be sent. This option is software selectable.

Gateway Address

In the format of nnn.nnn.nnn.nnn, where 0 ≤ nnn ≤ 255.

Description: A gateway is a computer that lies at the intersection of two networks and routes traffic correctly between them, while keeping traffic internal to the two networks separated. A gateway, such as a Cisco router, lies at the border between network1.net and network2.net. It correctly routes traffic bound for the internet out to its destination, while keeping traffic meant for within network1 on the network1.net side of the router and traffic for network2 on the network2.net side.

The Gateway address is the address of the router on the network on which the LMS1000 resides.

Netmask Address

In the format of nnn.nnn.nnn.nnn, where 0 ≤ nnn ≤ 255.

Description: A netmask is a series of bits designed to 'mask' certain portions of an IP address. The standard netmask for a class C network like FlashNet is 255.255.255.0 - basically the last octet, .0, says 'look here for the machine number, the rest (255) is network number'. The primary use for netmasks is in subnetting.

Host Addresses

In the format of nnn.nnn.nnn.nnn, where 0 ≤ nnn ≤ 255.

Description: The list of IP addresses from which connections to the LMS1000 are allowed. Simply put, these are addresses of machines permitted to make SNMP requests of the LMS1000.

Alarm Classes

You may specify an alarm class for each analog and function channel alarm limit, each binary channel, and each relay and LED channel which are set as alarm types in their respective configurations. An alarm class is specified by assigning an alarm class number (0 through 8, with 0 representing no alarm class) in the above configurations.

Program lines accept an alarm classification right hand term. This term is Kn, where n is a number from 1-8 which represents an alarm class number. The K term will be true if an alarm occurs on any analog or function channel alarm limit, or binary channel programmed with this alarm class number in its configuration.

Note: *Relay and LED channels programmed with an alarm class number will NOT activate the alarm class term in a control program.*

Alarm classes are configured with the following attributes:

Alarm Class Name (5 characters maximum): The name associated to this alarm class.
Alarm Class Number (1-8): The number associated to this alarm class.

Program Lines

Note: *Only one user at a time has access to the system internal program line editor. If the program line editor is in use and another user attempts to edit a program line, the user is notified that the editor is in use.*

Function Channel: The function channel's program line (79 characters maximum) determines the value of the function channel. A complete program line consists of a function channel number on the left side of the equation, and a set of analog channel numbers, function channel numbers, constants, and mathematical operators on the right side of the equation. The left and right sides of the equation are separated by an equal sign (=). The system uses this equation and the values of the analog or function channels to calculate the value associated with the function channel. As an example, the expression watts = volts × amps can be duplicated using the function expression Fn=A0001*A0003, where A0001 is a voltage input monitored on analog channel A0001, and A0003 is a current input monitored on analog channel A0003. Table 11 lists acceptable terms (and definitions) for the left and right sides of a function channel program line equation. The right side terms are joined by operators, also listed in Table 11.

The program line of any function channel can be entered or revised when configuring the function channels using the command CONFIG, or by using the command SET PROGRAM.

Note: *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port, option channels F64 and F63 are used to provide the values to the Power System MCA for 'Total Rectifier Output' and 'External Distribution Load' status readings respectively. Any value assigned/calculated in the program lines of these channels will be passed to the MCA and summed into the 'Total Charger Output' and 'Total Load Current' respectively (as viewed on LMS1000 channels A9902 and A9904).*

Table 11. Terms and Operators for Function Channel Program Lines

Left Side Terms

Left Term	Definition
Fn	Function Channel # n

Right Side Terms

Right Term	Definition
An	Value of input connected to analog channel # n
Fn	Value of input determined by function channel # n
nn.nn	Any constant (e.g. 52.08) (Four significant digits)

Right Side Operators

Symbol	Definition/Application
( )	For grouping expressions for precedence
*	multiply
/	divide
+	add
-	subtract

Note: *Numerical constants less than one must have a zero to the left of the decimal point.*

Relay and LED Channel: The relay and LED channel's program line (79 characters maximum) determines the conditions that will cause a specific relay to energize, or a specific status LED indicator to illuminate. A complete program line consists of a relay or LED channel number on the left side of the equation, and a set of conditions (Boolean logic expressions) which will cause the relay to energize, or the LED to illuminate on the right side of the equation. The left and right sides of the equation are separated by an equal sign (=). Table 12 lists acceptable terms (and definitions) for the left and right sides of a program line equation. The right side terms are joined by operators, also listed in Table 12.

The program line of any relay or LED channel can be entered or revised when configuring the relay or LED channels using the command CONFIG, or by using the command SET PROGRAM.

Note: *A relay output assigned to an Energy Management channel cannot be controlled by a program line.*

Note: *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port, option channel L7 is dedicated to provide an 'External Fuse Alarm' indication and channel L8 is dedicated to provide an 'External AC Fail Alarm' indication to the Power System MCA. Any state generated by the program lines of these channels will be passed to the MCA as an 'External Fuse Alarm' and an 'External AC Fail Alarm' indication respectively.*

Table 12. Terms and Operators for LED Channel and Relay Channel Program Lines

Left Side Terms	Definition
Rn	Relay Channel # n
Ln	LED Channel # n

Right Side Terms	Definition
A	Any Analog Alarm
An	Analog Alarm For Input # n
An.l	Alarm Limit l (1-4) for Analog Input # n)
F	Any Function Alarm
Fn	Function Alarm For Input # n
Fn.l	Function Alarm Limit l (1-4) for Function Input # n
B	Any Binary Alarm
Bn	Binary Alarm For Input # n
R	Any Relay Channel Activated
Rn	Relay Channel # n Activated
L	Any LED Channel Activated
Ln	LED Channel # n (Activated
Wn	Day of the Week Specified by # n (1-7, Sunday=1)
Mn	Month of Year Specified by # n (1-12)
Dn	Numerical Day of Month Specified By # n (1-31)
Pn	Programmable Time Period Specified by # n (See Command "SET PERIOD")
Cn( )	An Active (true) Term in the Program if n or More Combinations of Terms Inside the Parenthesis are Active.

Right Side Operators	Definition
( )	For grouping expressions for precedence
!	Logic NOT
&	Logic AND
^	Logic EXCLUSIVE OR
¦	Logic INCLUSIVE OR

Right Side Terms	Definition
S1	An Active (true) Term in the Program if there is any new analog or binary alarm; true for only one second.
S2	An Active (true) Term in the Program if the S2 pushbutton on the front of the LMS1000 is pushed; true for only one second.
Kn	An Alarm Classification Term, where n is a number from 1-8 which represents an alarm class number. The K term will be active (true) if an alarm occurs on any analog or function channel alarm limit, or binary channel programmed with this alarm class number in its configuration. ***Note:*** *Relay and LED channels programmed with an alarm class number will NOT activate the alarm class term in a control program.*
E1 (Relay and LED Channels Only)	Sequencer Error, Sequencer Aborted. ***Note:*** *The channel name should reflect **this** entry, such as naming the channel "Sequencer Aborted".*

Note
(When MCA Interface is Used)

1) DO NOT use VPS/NPS analog channels (A9001-A9114) or NPS analog channels (A9901-A9907 and Ann51-Ann60) in relay channel or LED channel program lines.

2) VPS/NPS binary channels (B9001-B9115) and NPS binary channels (B9901-B9946 and Bnn01-Bnn60) may be used in relay channel and LED channel program lines.

Note: *Numerical constants less than one must have a zero to the left of the decimal point.*

Examples of Various Types of Program Lines

Refer to Table 13 for example program lines and explanations.

Table 13. Example Control Program Lines

Program Line	Explanation
R0001=A	Relay 1 will energize when an alarm is turned in for any analog channel.
R0002=B0005	Relay 2 will energize when an alarm is turned in for binary channel #5.
R0003=R0001 & A0003	Relay 3 will energize if relay 1 energizes and an alarm is turned in for analog channel #3.
R0004=! B	Relay 4 will energize if there are no alarms turned in for any binary channel.
R0005=A0001 _ B0002	Relay 5 will energize if an alarm is turned in for analog channel #1 or binary channel #2, but not both.
L0005=R0001 ¦ R0002	LED 5 will illuminate if relay 1 energizes or relay 2 energizes.
R0006=C2 (A0001, A0002, A0003)	Relay 6 will energize if two or more of the listed analog channel #s turn in an alarm.
R0001=(A0002 ¦ B0005) & C0002 (R0003, R0004, R0005)	Relay 1 will energize if an alarm is turned in for analog channel #2 or binary channel #5, and two or more relays R3, R4, or R5 energize.
R0001=D0003	Relay 1 will energize during the third day of the month.
R0002=P1 & W6	Relay 2 will energize on Friday for the time interval specified by period P1.
F0001=(A0001+A0002+A0002) / 3	Function Channel #1 averages the values on analog channel #1 and #2 and #3.

Program Line Time Periods

Program lines for relay and LED channels can contain a programmable time period term. This term is Pn, where n is a number from 1 through 8 which specifies one of the eight available time periods.
A time period is programmed using the format "FROM: hh:mm:ss TO: hh:mm:ss". The "FROM" time does not necessarily have to be less than or before the "TO" time. As an example, if time period 1 "FROM" time is set to 08:00:00 and the "TO" time is set to 07:00:00, then the control program term P1 will be true 23 hours a day. It will be false between 7:00 and 8:00 in the morning.

Time periods are programmed using the command SET PERIOD.

Common Channel Attributes

When configuring the system, channels should be configured first because other configurable features of the system reference these channels. Each channel configuration contains common attributes as described below.

Note: *The "On and Off Delays" are not configurable for MCA Interface channels. The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

Note: *The "Channel Name" and "On and Off Delays" are not configurable for LMS1000 self diagnostics binary channels B0081 – B0096.*

a. Channel Active (Y or N): Prevents unused (spare) channels from appearing in alarm reports, scan reports, etc. It is recommended that all unused channels are set to be NOT active.

b. Channel Name (30 characters maximum): This is a user determined description of the channel. Consideration should be made in naming a channel. Information displayed can be limited by entering part of a channel(s) name after certain commands. Refer to "Operating LMS1000" in the *User Instructions* (Section 5847) for details. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

c. System Alarm Reporting (Y or N): This directs the system whether or not to initiate a System Alarm Report if an alarm occurs on this channel. System Alarm Reporting is described later in this section.

d. On Delay Time (0-9999) (s for seconds, m for minutes, h for hours): Defines the amount of time that an alarm condition must exist before the system recognizes it as an alarm condition. An alarm condition for an analog, binary, and function channel is defined as when any alarm limit is exceeded. An alarm condition for a relay or LED channel is defined as when a preprogrammed condition occurs which causes the relay to energize and the LED to illuminate.

   Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

e. Off Delay Time (0-9999) (s for seconds, m for minutes, h for hours): Defines the amount of time that an alarm condition must cease before the system recognizes that the alarm condition ceased. Refer to "On Delay Time" above for a description of "alarm condition".

   Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

In addition to the common channel attributes, each channel has other attributes specific to them as described below.

Analog Channel Attributes

Each analog channel can be configured for the following additional items.

Note: *Only "Channel Active", "Channel Name", "Sub-Access Identifier", "System Alarm Reporting", "Monitor Type", and "Monitor Value Format" are configurable for MCA Interface channels. The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

a. Sub-Access Identifier (20 characters maximum): This parameter applies only to TL1 commands/messages. The Sub-Access Identifier identifies a specific sub-entity within an NMA system, such as a specific rectifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.

b. Transducer Type (Shunt, Current, Voltage, Temp, or None): Specifies the type of signal connected to the input associated to this channel.

   If "Shunt" is selected, the following attribute is presented...

   Shunt type (50mv or 100mv): Specifies the shunt size connected to the input associated to this channel.

   If "Current" is selected, the following attribute is presented...

4-20 mA signal (Y or N): Allows simple programming of analog channels when monitoring 4-20 ma current loop input signals. The system automatically makes the necessary offset correction required when monitoring these inputs.

If "Voltage" is selected, the following attribute is presented...

Enter the transducer full-scale output in Volts: Specifies the maximum voltage (in volts) to be measured by this channel.

c. Scale Factor (20000 maximum): Equals full scale rating of the sensing device. This attribute is not presented when "Digital Temp" is selected as the "Transducer Type".

d. Polarity ('+' for Positive [default], '-' for Negative): Provides means to specify the sign of the signal connected to an analog input. This allows the value of the input signal to be processed correctly for display to the user and for calculation of statistics and alarm limit activation.

Positive polarity ('+'): (default value) The value of the input signal is displayed using the sign as provided by the hardware circuitry. The processing of alarm limits and statistics is performed with the most positive value being a 'High' signal and the most negative value being a 'Low' signal.

Negative polarity ('-'): The value of the input signal is inverted (multiplied by -1) before it is displayed or used for processing. The processing of alarm limits and statistics is performed with the most negative value being a 'High' signal and the most positive value being a 'Low' signal. For example, given a float voltage of –54.0V, –56.0V is a high limit.

e. Alarm Limit Mode: Provides means to specify how processing of alarm limits is performed.

Normal mode: (default value) Analog alarm limits are processed using the 'High' and 'Low' values as determined by the analog channel's polarity attribute (discussed above).

Bipolar mode: Analog alarm limits are processed using zero as the 'Low' value and the most positive or negative value as the 'High' value. An alarm (high or low) can only occur if the sign of the alarm limit matches the sign of the reading value.

For example, this may be used in detecting both high charge current and a high discharge current on a battery shunt. Assume a shunt is wired for a negative float current reading, and it has a high alarm limit of –6.0 amps to detect a high float current. It can then also have a high limit of +100.0 amps to detect a high discharge current. So, in this example there are two high alarms, with opposite polarity.

f. Four Alarm Limits each with the following attributes:

Enabled (Y or N): Y=this alarm limit is enabled. N=this alarm limit is disabled.

Value (5 characters-20000 maximum): Threshold value of the alarm limit. This value cannot exceed the scale factor.

Type (H for high, or L for low): Determines if this is a high or low limit setpoint.

Name (10 characters maximum): User determined description of the alarm. To use the rate (analog channel maximum load percentages) feature, this description must contain the text CAP or SIZ.

Notification Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes the severity of this alarm or event condition.

CR - critical alarm NA - not alarmed

MJ - major alarm NR - not reported when event occurs

MN - minor alarm

Service Effect Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes how this alarm or event affects service.

SA = service-affecting condition, immediate action required

NSA = nonservice-affecting condition, action required

Alarm Class Number (0-8): Assigns one of the 8 alarm classifications to this alarm limit. (0 represents no alarm class.)

Condition Type (20 characters maximum): This parameter applies only to TL1 commands/messages. A description of this alarm or event state. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

Condition Description (40 characters maximum): This parameter applies only to TL1 commands/messages. A user-defined text message which provides a detailed description of the alarm, event, or condition of the limit

or channel to which it applies. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

g. Unit Text (4 Characters maximum): Describes the analog input's unit of measure. To use the rate (analog channel maximum load percentages) feature, the UNIT TEXT must be AMPS. To display temperature readings in Fahrenheit, the UNIT TEXT for the appropriate analog channel must be set to DEGF.

h. Monitor Type (10 characters maximum): This parameter applies only to TL1 commands/messages. A description of the unit that the above alarms are measured in (ex. VOLTDC, CURDC, etc.). Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Table 6-1.

i. Monitor Value Format (I or D): This parameter applies only to TL1 commands/messages. Identifies the monitored value (monval) either as a decimal integer or as an unrestricted decimal number. Valid entries are "I" for integer or "D" for decimal.

Binary Channel Attributes

Each binary channel can be configured for the following additional items.

Note: *The "Alarm Condition" attribute of the MCA Interface channels is not configurable. The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

Note: *The "Alarm Condition" attribute is not configurable for LMS1000 self diagnostics binary channels B0081 – B0096.*

a. Sub-Access Identifier (20 characters maximum): This parameter applies only to TL1 commands/messages. The Sub-Access Identifier identifies a specific sub-entity within an NMA system, such as a specific rectifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.

b. Condition Type (20 characters maximum): This parameter applies only to TL1 commands/messages. A description of this alarm or event state. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

c. Condition Description (40 characters maximum): This parameter applies only to TL1 commands/messages. A user-defined text message which provides a detailed description of the alarm, event, or condition of the limit or channel to which it applies. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

d. Notification Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes the severity of this alarm or event condition.

CR - critical alarm NA - not alarmed

MJ - major alarm NR - not reported when event occurs

MN - minor alarm

e. Service Effect Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes how this alarm or event affects service.

SA = service-affecting condition, immediate action required

NSA = nonservice-affecting condition, action required

f. Alarm Condition (CC or CO): Determines the alarm state. CC=contacts closed, CO=contacts open.

Four Input Binary Circuit Card: CC=contacts closed (12 to 60 volts DC during alarm condition), CO=contacts open (less than or equal to 2 volts AC or DC during alarm condition). Note that signals between 2 and 12 volts are undefined.

Eight Input Binary Circuit Card: CC=contacts closed (12 to 60 volts DC during alarm condition), CO=contacts open (less than or equal to 2 volts DC during alarm condition). Note that signals between 2 and 12 volts are undefined.

Expansion Assembly Circuit Card: CC=contacts closed (12 to 60 volts DC during alarm condition), CO=contacts open (less than or equal to 2 volts DC during alarm condition). Note that signals between 2 and 12 volts are undefined.

g. Alarm Class Number (0-8): Assigns one of the 8 alarm classifications to this channel. (0 represents no alarm class.)

Function Channel Attributes

Each function channel can be configured for the following additional items.

a. Sub-Access Identifier (20 characters maximum): This parameter applies only to TL1 commands/messages. The Sub-Access Identifier identifies a specific sub-entity within an NMA system, such as a specific rectifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.

b. Four Alarm Limits each with the following attributes:

   Enabled (Y or N): Y=this alarm limit is enabled. N=this alarm limit is disabled.

   Value (5 characters-99999 maximum): Threshold value of the alarm limit.

   Type (H for high, or L for low): Determines if this is a high or low limit setpoint.

   Name (10 characters maximum): User determined description of the alarm.

   Notification Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes the severity of this alarm or event condition.

   CR - critical alarm NA - not alarmed

   MJ - major alarm NR - not reported when event occurs

   MN - minor alarm

   Service Effect Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes how this alarm or event affects service.

   SA = service-affecting condition, immediate action required

   NSA = nonservice-affecting condition, action required

   Alarm Class Number (0-8): Assigns one of the 8 alarm classifications to this alarm limit. (0 represents no alarm class.)

   Condition Type (20 characters maximum): This parameter applies only to TL1 commands/messages. A description of this alarm or event state. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

   Condition Description (40 characters maximum): This parameter applies only to TL1 commands/messages. A user-defined text message which provides a detailed description of the alarm, event, or condition of the limit or channel to which it applies. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

c. Unit Text (4 Characters maximum): Describes the function channel's unit of measure. To use the Power Metering software option, the UNIT TEXT must contain the text KW.

d. Monitor Type (10 characters maximum): This parameter applies only to TL1 commands/messages. A description of the unit that the above alarms are measured in (ex. VOLTDC, CURDC, etc.). Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Table 6-1.

e. Monitor Value Format (I or D): This parameter applies only to TL1 commands/messages. Identifies the monitored value (monval) either as a decimal integer or as an unrestricted decimal number. Valid entries are "I" for integer or "D" for decimal.

f. Program Line (79 characters maximum): A control program that defines the input value of this channel. To use the Power Metering software option, refer to "Operating LMS1000" in the *User Instructions* (Section 5847) to properly configure the program line. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

LED Channel Attributes

Each LED channel can be configured for the following additional items.

a. Sub-Access Identifier (20 characters maximum): This parameter applies only to TL1 commands/messages. The Sub-Access Identifier identifies a specific sub-entity within an NMA system, such as a specific rectifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.

b. Color (Red, Green, or Amber): Specifies the color the LED illuminates.

c. Alarm Type (Y or N): Y=recorded in alarm log (required if System Alarm Reporting is desired for this channel, or an alarm class of 1 through 8 is assigned to this channel). N=not recorded in alarm log.

d. Alarm Class Number (0-8): Assigns one of the 8 alarm classifications to this channel. (0 represents no alarm class.)

e. Condition Type (20 characters maximum): This parameter applies only to TL1 commands/messages. A description of this alarm or event state. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

f. Condition Description (40 characters maximum): This parameter applies only to TL1 commands/messages. A user-defined text message which provides a detailed description of the alarm, event, or condition of the limit or channel to which it applies. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

g. Notification Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes the severity of this alarm or event condition.

CR - critical alarm NA - not alarmed

MJ - major alarm NR - not reported when event occurs

MN - minor alarm

h. Service Effect Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes how this alarm or event affects service.

SA = service-affecting condition, immediate action required

NSA = nonservice-affecting condition, action required

i. Control Type (10 characters maximum): This parameter applies only to TL1 commands/messages. A description of the NMA system external control entity that this channel is controlling. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to Appendix G of TR-NWT-000833, issue 5.

j. Program Line (79 characters maximum): A control program that defines the conditions under which the programmable LED illuminates.

Relay Channel Attributes

Each relay channel can be configured for the following additional items.

Note: *Relay channels associated with an energy management channel cannot be programmed.*

a. Sub-Access Identifier (20 characters maximum): This parameter applies only to TL1 commands/messages. The Sub-Access Identifier identifies a specific sub-entity within an NMA system, such as a specific rectifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.

b. Alarm Type (Y or N): Y=recorded in alarm log (required if System Alarm Reporting is desired for this channel, or an alarm class of 1 through 8 is assigned to this channel), N=not recorded in alarm log.

c. Alarm Class Number (0-8): Assigns one of the 8 alarm classifications to this channel. (0 represents no alarm class.)

d. Condition Type (20 characters maximum): This parameter applies only to TL1 commands/messages. A description of this alarm or event state. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

e. Condition Description (40 characters maximum): This parameter applies only to TL1 commands/messages. A user-defined text message which provides a detailed description of the alarm, event, or condition of the limit or channel to which it applies. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

f. Notification Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes the severity of this alarm or event condition.

CR - critical alarm NA - not alarmed

MJ - major alarm NR - not reported when event occurs

MN - minor alarm

g. Service Effect Code: This parameter applies only to TL1 commands/messages. Consists of one of the following codes which describes how this alarm or event affects service.

SA = service-affecting condition, immediate action required

NSA = nonservice-affecting condition, action required

h. Affected by ACO (Y or N): An Alarm Cut-Off feature allows temporary disabling of existing alarms. This feature is for applications where programmable relays are used as alarm relays. For alarm cut-off to be functional, the appropriate relay channel has to be configured for alarm cut-off. The system can be programmed to automatically release the alarm cut-off feature at a selected time interval. See the discussion on "cycle frequency" which follows.

i. Cycle Frequency (0-1440 minutes): When a relay is energized, the system can be programmed to de-energize the relay at a selected time interval. This time interval is determined by the relay's "cycle frequency". This feature resets external alarm logic that requires an open to close transition for alarming. During a relay alarm condition, the relay remains energized for the time duration determined by the value of the relay's cycle frequency. Once this time period expires, the system de-energizes the relay for 15 seconds. The system will then re-energize the relay if the alarm condition still exists. If the relay channel is set to be affected by ACO, the cycle frequency is also used to automatically release the alarm cut-off feature at a time interval determined by the cycle frequency. The system automatically performs the equivalent of a CLR ACO command at the end of the "cycle frequency". To disable these features, set the "cycle frequency" to zero.

j. Control Type (10 characters maximum): This parameter applies only to TL1 commands/messages. A description of the NMA system external control entity that this channel is controlling. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to Appendix G of TR-NWT-000833, issue 5.

k. Program Line (79 characters maximum): A control program that defines the conditions under which the relay energizes.

User Attributes

A maximum of eight users can be configured with each user having the attributes described below. The programmable attributes of each user can be separated into three groups as follows:

Basic User Configuration - This is the minimum information required to specify a user.

Required Configuration for Reports and Callbacks - This is the minimum information required to specify a user that is going to use the callback feature or receive a System Alarm Report.

Optional Configuration for User Reports - This is the minimum information required to specify a user that is going to receive any of the User Reports.

Basic User Configuration: Enter the information describe in a) through e), and v) below.

Required Configuration for Reports and Callbacks: Enter the information described in f) through m) below.

Optional Configuration for User Reports: Enter the information described in n) through v) below. Also enter the information described in "Required Configuration for Reports & Callbacks" above. User Channels must also be specified.

a. User Active (Y or N): The purpose of this attribute is so unused (spare) users can be configured as inactive. A "Y" (Yes) indicates the user is active while a "N" (No) indicates the user is NOT active. It is recommended that unused users be made inactive. This eliminates a password from the list of available valid passwords and reduces the chance of unauthorized access.

b. Name (30 characters maximum unless used with TL1, then 10 characters maximum): A description that identifies the user. This name is used by the system for the following:

In the greeting header when a user logs on.

In the report header for an alarm report.

Names are shown to a user sending mail so they can determine which users should receive their mail.

Any user logging on to the system or changing system configuration has their name stamped into the Event Log. The Event Log also records other pertinent information such as the type of activity, and the date and time of the activity.

c. Password (8 Characters maximum): Each user receives a unique password that must be entered to gain access to the system.

Note: *If the user is to access the system through the TL1 port, the user's password must contain two non-alpha characters. One of these must be a symbol. ([%], [#], and [+] are the only symbols which can be used.)*

d. Access Level (1 - 6): The access level determines which commands are available to the user. The commands are separated into six different command levels. Level 6 allows the user to have access to all commands. Commands available in a specific command level also include the commands of all lower command levels. As an example, commands in levels 1, 2, and 3 are also

available to users programmed for access to level 4 commands. The commands are divided into the following levels.

Level 1	Interrogate/Status Commands
Level 2	Display Channel Configuration
Level 3	Set Date & Time
Level 4	Alarm Acknowledge, Alarm Canceling
Level 5	Configure Channels
Level 6	Configure Users, Upload & Download

e. Callback Feature (Y or N): A feature that allows increased security when accessing the system via its modem. After a user calls the system and enters his password, the system will hang-up and call the user back at the designated phone number.

f. Primary Phone Number (20 Characters maximum): This phone number is used for callbacks, System Alarm Reports, and User Reports. The primary phone number is used only during selectable valid days and hours. Valid characters include:

0-9	processed as normal DTMF code
*	processed as normal DTMF code
#	processed as normal DTMF code
B	wait for pager system to answer, then transmit pager ID code
,	two second pause (comma)

when used with the TL1 port, only alphanumeric characters are valid

all other characters are ignored

g. Valid Days & Hours for Primary Phone Number (1-7 with 1=Sunday; 00-23): These variables specify the days and hours when the primary phone number is used for callbacks and the primary phone number or primary Email is used for System Alarm Reports and User Reports. A range of days is specified by entering the beginning and ending days of the valid period using numbers to represent the days. A range of hours is specified by entering the beginning and ending hour of the valid period.

h. Alternate Phone Number (20 Characters maximum): This phone number is used for callbacks, System Alarm Reports, and User Reports when the current date and time are not valid. See primary phone number for valid characters.

i. Primary E-mail: This is the Email address used for System Alarm Reports and User Reports during the "Valid Days & Hours for Primary Phone Number".

j. Alternate E-mail: This is the Email address used for System Alarm Reports and User Reports outside of the "Valid Days & Hours for Primary Phone Number".

k. Report Device (Modem, Ethernet, X25 [if TL1/X.25 option installed], or Telnet [if TL1 over Ethernet option installed]): Allows the user to select a Report Device (either the system's modem, Email via the Ethernet port, or a TL1 network) that the system uses to issue a System Alarm Report or User Report.

l. Report Mode (Off, Pager, M300, M1200, M2400, M9600, M28800, M33600, M56000): This prompt appears if "Modem" is selected above as the Report Device. Allows the user to select which method of communication is used when sending System Alarm Reports and User Reports, either pager or modem at xxx bits/s.

Report Mode (OFF or E-mail): This prompt appears if "Ethernet" is selected above as the Report Device. E-mail = System Alarm Reports and User Reports sent via Email. OFF = alarm reports are not processed.

Report Mode (OFF or TL1): This prompt appears if "X25" or "Telnet" is selected above as the Report Device. TL1 = TL1 report messages processed via the TL1 port. OFF = alarm reports are not processed.

m. Report Retry Time (0-1440 minutes): Allows the user to select the number of minutes the system waits before attempting another callback, User Report, or TL1 report message in the event the prior attempt failed. Zero represents no retry. (This retry time has no effect on System Alarm Reporting.)

n. TL1 Report Condition Interval (0-1440 minutes): This prompt appears if "X25" or "Telnet" is selected above as the report device. Specifies how frequently the unit will attempt a Report Condition message. A value of '0' disables sending of Report Condition messages.

Note: *Parameters o) through u) do not appear if "X25" or "Telnet" is selected as the Report Device.*

o. Occurred Alarm Report (Y or N): Selects sending a "User Report" of new alarms that have occurred on "user channels".

p. Retired Alarm Report (Y or N): Selects sending a "User Report" of alarms that have cleared on "user channels".

q. Persistent Alarm Report (Y or N): Selects periodically sending a "User Report" of alarms that still exist on "user channels".

r. Persistent Alarm Report Period (0-1440 minutes): This prompt appears if "Y" is selected above for the Persistent Alarm Report parameter. Specifies how frequently the unit will attempt a Persistent Alarm Report. The number is in minutes and can be set to a maximum of 1440 (one day). Whenever the total number of minutes in a day (that have elapsed since midnight) is evenly divisible by this number, a Persistent Alarm Report is made, provided there is an existing alarm on a User Channel. For example, if this number is set to 480 and an alarm is present all day, the system would issue a report at 8 a.m., 4 p.m. and 12 midnight. Moreover, if the number were set to 17, then the system would issue a report at 12:17 a.m., 12:34 a.m., 12:51 a.m., 1:08 a.m. etc.

s. Daily Report (Y or N): Selects whether the user will receive a daily "User Report".

t. Daily Report Command (30 characters maximum): This prompt appears if "Y" is selected above for the Daily Report parameter. This is the command (standard or programmable) used to issue the daily User Report.

u. Daily Report Time (HH:MM): This prompt appears if "Y" is selected above for the Daily Report parameter. This is the time the daily "User Report" is performed for the user.

v. User Channels: A method of limiting the channels that the system will process for the above User Reports. User channels are also used as a method of limiting the information displayed by other commands (refer to "Operating LMS1000" in the *User Instructions* (Section 5847) for details. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system). Users configured to report via a TL1 network can only specify channels that have been configured as part of an access identifier.

Groups

Up to eight Groups can be configured in the system. Each one is programmable for a 30 character name plus any combination of channels. Channels are specified by entering either a single Channel Number (e.g. A0001, B0008) or by entering a range of channels (e.g. A0001-0008, L0001-0012).

Groups are programmed using the command CONFIG.

System Alarm Reporting

To program System Alarm Reporting, the user first decides which alarms are to be reported as part of the System Alarm Report. This is done by configuring the appropriate channels for the feature.

Then configure at least one user.

If Email notification was selected, use the command "SET EMAIL" to enter the following parameters, "Primary DNS Address", "Secondary DNS Address", "Local SMTP Server Address", and "Email Return Address". Also set the "IP Network Address", "IP Gateway Address", and "IP Netmask" using the commands IP ADDRESS, IP GATEWAY, and IP NETMASK. See your IT Department for these values. The Local SMTP Server must be capable of relaying Emails outside of the company's network if any User Email address will be entered that is outside of the company's network.

Next, use the command "SET REPORT" to configure the System Alarm Reporting feature. The command allows four parameters to be specified as described below.

Report Mode: This parameter determines the operating mode of the System Alarm Report feature and can be set to off ("OFF"), Single ("S") or Continuous ("C"). The Single Report mode means the system reports the new alarms once to the first user with which a data connection is established or an Email is sent. The Continuous Report mode means the system continues to make reports until a user acknowledges it using the ACK command.

User Calling Sequence: The attribute specifies which users the system will call or Email in an attempt to issue the System Alarm Report. The User Sequence may contain up to 20 digits that designate the user number. For example, a valid User Sequence could be "121". In this case, user one is the called or Emailed first. If the report cannot be made, user two is called or Emailed and if that report is unsuccessful, user one is called or Emailed again. If none of the attempts are successful, the system waits the specified Retry Time (see below) before repeating the process.

Report Retry Time: If all users in the Calling Sequence are called or Emailed and no System Alarm Report is successfully made, the system waits the specified Retry Time before repeating the process. The Retry Time is a numeric value that ranges from 0 up to 1440 minutes (one day), with 0 representing no report retry. The default value is 10 minutes.

Auto-Logoff Time: If selected, the system uses its internal modem to make alarm reports. If the system must make a report and a user is logged on using the modem, he or she is automatically logged off after a predetermined amount of time. This is known as the Auto-Logoff Time and can range between 30 and 600 seconds.

Initial Configuration

Note: *If configuration information has been saved from another LMS1000 by using the DOWNLOAD command, this information can be copied into this system by using the UPLOAD command. Refer to "Operating LMS1000" in the "User Instructions" (Section 5847) for additional information. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

Setting Local Port Communications Parameters

This procedure shows the user how to change the local port data rate. Available local port communications parameters are shown in Table 14.

Note: *Modem port communications parameters cannot be set. The data rate for the local port is the only communications parameter that can be changed.*

Table 14. Available Local Port Communications Parameters

Data Rate (Bits/s)	Parity	Data Bits	Stop Bits
300, 600, 1200, 2400, 4800, 9600, or 19200	n for none	8	1

Default setting shown in underlined type.

PROCEDURE:

1. After logging onto the system, type ***SET COM***. Then press ***ENTER***.

   ```
   Command <6>: SET COM
   ```

2. The system displays the current communications parameters for the local port.

   ```
   bits/s, parity, data bits, stop bits.
   ```

3. The system responds with...

   ```
   Enter new setup:
   ```

4. Enter a new data rate for the local port, if desired.

5. Press ***ENTER*** to exit the command. If parameter's were not entered, the existing settings are saved.

Setting Gateway Port Parameters (if Gateway Software Option Installed)

This procedure shows the user how to change the Gateway port data rate. This command also lists the settings of all Gateway port communications parameters.

Note: *The data rate for the Gateway port is the only communications parameter that can be changed. The other communications parameters are fixed at no parity, 1 stop bit, and 8 data bits.*

PROCEDURE:

1. After logging onto the system, type ***SET GATEWAY***. Then press ***ENTER***.

   ```
   Command <6>: SET GATEWAY
   ```

2. The system displays the current communications parameters for the Gateway port.

   ```
   bits/s, parity, data bits, stop bits.
   ```

3. The system responds with...

   ```
   Enter new setup:
   ```

4. Enter a new data rate for the Gateway port, if desired.

   Available data rates are 300, 1200, 2400, 9600, 19200 bps (default is 9600 bps).

CAUTION! Possible data loss may occur if the LMS1000 Gateway Port data rate is not matched to the data rate of the LMS1000 local or modem port used to access the customer equipment connected to the LMS1000 Gateway port.

5. Press ***ENTER*** to accept or change the present setting and continue. If a parameter value is not entered, the setting is not changed.

6. The system displays the present 'Gateway Mode Setting' parameter and prompts for a new setting:

   ```
   GATEWAY mode setting: NORMAL
   New mode setting [NORMAL or GLOBAL]:
   GLOBAL
   ```

7. If a different setting is desired enter the new parameter value.

8. Press ***ENTER*** to accept or change the present setting. If a parameter value is not entered, the setting is not changed saved. The system then exits the command.

Setting System Configuration

This procedure shows the user how to initially program the system using the command SET SYSTEM. The SET SYSTEM command steps the user through various system commands that are normally separate commands, but are grouped together and prompted automatically by the system. User responses to this series of commands will program the system for its application. In most instances, the system first lists current information, and then prompts for new or revised information to be entered. If the current information is accurate, the user should press ***ENTER*** to proceed. Refer to "Commands" in the *User Instructions* (Section 5847) for a typical screen display of the SET SYSTEM command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

PROCEDURE:

1. After logging onto the system, type ***SET SYSTEM***. Then press ***ENTER***.

   ```
   Command <6>: SET SYSTEM
   ```

Setting the Date, Time, Unit Name, Unit Number, System Identifier, Unit Header, Unit Pager Code, and Pager Delay

Note: *This information can also be programmed through the commands SET DATE, SET TIME, and SET UNIT which are described later in this section.*

1. The system responds with...

   ```
   Date is current info.
   Use Format mm/dd/yy
   ```

2. Type the current date in the format specified, then press ***ENTER***.
3. The system responds with...

   ```
   Time is current info.
   Use Format hh:mm:ss
   ```

4. Type the current time in the format specified, then press ***ENTER***.
5. The system responds with...

   ```
   LMS1000 v2.0.0
   Unit Name: current info - Unit #current
   info
   System Identifier: current info
   Unit Header:
   current info
   Unit Name:
   ```

6. Type the desired unit name (30 characters maximum), then press ***ENTER***.
7. The system responds with...

   ```
   Unit #
   ```

8. Type the desired unit number (4 digits maximum), then press ***ENTER***.
9. The system responds with...

   ```
   System Identifier:
   ```

10. This parameter applies only to TL1 commands/messages. Type the desired System Identifier (20 characters maximum), then press ***ENTER***. This data parameter is used to identify the destination of command messages and the source of response and autonomous messages in an NMA system.
11. The system responds with...

    ```
    Unit Header:
    ```

12. Type the desired unit header (79 characters maximum), then press ***ENTER***. The unit header is displayed when a user logs onto the system.
13. The system responds with...

    ```
    Unit Pager Code:
    ```

14. If required, type the desired unit pager code (20 characters maximum), then press ***ENTER***. The Unit Pager Code is the phone number at which the system is located followed by any terminating character required. This is the number that will appear in the display window of the paging system beeper unit.
15. The system responds with...

    ```
    Pager Delay:
    ```

16. Type the desired pager delay (0-99), then press ***ENTER***. The pager delay is the time delay (in seconds) between the last digit dialed in a pager phone number and outputting the pager PIN number.

Configuring Alarm Class Names

If Alarms are to be classified by the Alarm Class feature, enter a name for each of the available Alarm Classes.

Note: *This information can also be programmed through the command SET CLASS which is described later in this section.*

1. The system responds with the first Programmable Alarm Classification.

   ```
   Programmable Alarm Classifications
   K1.none
   ```

2. Type the name of the Alarm Class (5 characters maximum), then press ***ENTER***. ***Note:*** To delete a name, just enter a ***SPACE*** then press ***ENTER***.

   ```
   Alarm Class Name:
   ```

3. The system will display the second through eighth Programmable Alarm Classification. Enter the required data for each Programmable Alarm Classification as described above.

Adding and Configuring LMS1000 Expansion Nodes

This procedure shows the user how to add and configure Expansion Nodes. Use this procedure if the system contains 586505000/586505500 Expansion Cabinets, 582140000/582140001/582126100 Secondary Bays with LMS1000 I/O cards, and/or 586505000/586505500 Expansion Assemblies.

Note: *This information can also be programmed through the command NODE ADD which is described later in this section.*

Note: *Refer to "Operating LMS1000" in the* User Instructions *(Section 5847) for a description of nodes. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

1. The system searches for and adds to the database all Expansion Nodes found on the network. The Nodes are arbitrarily assigned numbers prefixed with an "X". The "X" indicates the Node is currently not configured. Also displayed is the configuration of the Node as it was programmed at the factory.

```
Searching for new nodes
Node#  Name         Spec. Number     Ser.#
Loc  Echelon Id #
X01    ---          58212190001     12346
L    1A2B3C4D5F6A
X02    ---          58212190001     12346
R    1A2B3C4D5F6B
X03    ---          58212190002     12347
L    1A2B3C4D5F6C
X04    ---          58212190002     12347
R    1A2B3C4D5F6D
```

2. The system then prompts to select a Node to configure. Type the number of the Node to configure (as listed). Press ***ENTER*** to proceed.

```
Which node? : X01
```

3. Enter configuration information as it is displayed. Press ***ENTER*** to proceed.

```
Node Number: ---
Node Number: 01
Node Name: ---
Node Name: Main Distribution Bay 1
Spec Number: 58212190001
Spec Number:
Serial Number: 12346
Serial Number:
Location Number: L
Location Number:
Module 1 List Number: --
Module 1 List Number: AB
Module 2 List Number: --
Module 2 List Number: D
Module 3 List Number: --
Module 3 List Number: T
Module 4 List Number: --
Module 4 List Number: BK
```

4. After all configuration parameters are presented, the system prompts to save the changes. Type ***Y*** and press ***ENTER*** to save the Node's configuration.

```
Save changes (Y or N): Y
Storing node configuration
```

5. The system prompts to add channels to the Node's configuration. Type ***Y*** then press ***ENTER***.

```
Edit Node Channels (Y or N): Y
```

6. Add from the available channels those that are active in the system.

   Note: *Type the number(s) of available channels to be added to the Node's configuration, then press* **ENTER**. *Channels can be specified by entering a single channel number (e.g. A1, B8), or by entering a range of channels (e.g. A1-8, B1-12). To continue, press* **ENTER** *without specifying a channel.*

```
Enter channel (e.g. A12 or A1-6) or D to
display.
Add Channel: A1
Add Channel: A7-11
Add Channel: B1-4
Add Channel:
```

7. The system prompts to delete channels that were previously added to the Node's configuration. To continue, press ***ENTER*** without specifying a channel.

```
Enter channel (e.g. A12 or A1-6) or D to
display.
Del Channel:
Del Channel:
```

8. The system prompts to configure another Node. Type ***Y*** then press ***ENTER*** if there are remaining Nodes that need to be configured. Otherwise type ***N*** then press ***ENTER***. Repeat the above steps until all Nodes are configured.

```
Configure another node? (Y or N):
```

Configuring Analog Channels

Refer to the worksheets (or copies of) located at the end of "Installing LMS1000" as a guide in programming the various channels associated with the system.

Note: *This information can also be programmed through the command CONFIG A_ which is described later in this section.*

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

Note: *Only "Channel Active", "Channel Name", "Sub-Access Identifier", "System Alarm Reporting", "Monitor Type", and "Monitor Value Format" are configurable for MCA Interface channels. The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

1. The system responds with the first analog channel default configuration, followed by...

```
Channel active (Y or N):
```

2. Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.
3. If "N" was entered, the system displays another analog channel configuration. If "Y" was entered, the system allows the default configuration information of the current analog channel to be changed as shown below.
4. The system responds with...

```
Name: current info
Name:
```

5. Type the desired name for this analog channel (30 characters maximum), then press ***ENTER***.
6. The system responds with...

```
Sub-access Identifier: current info
Sub-access Identifier:
```

7. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.
8. The system responds with...

```
System Alarm Report mode: current info
System Alarm Report mode (Y or N):
```

9. Type ***Y*** if the system is required to initiate an alarm report if an alarm limit is exceeded on this channel and ***N*** if not, then press ***ENTER***.
10. The system responds with...

```
Transducer Type: current info
Transducer Type (Shunt, Current,
Voltage, Temp, or None):
```

11. Type ***SHUNT***, ***CURRENT***, ***VOLTAGE***, ***TEMP***, or ***NONE*** to specify the type of signal connected to the input associated to this channel. Then press ***ENTER***.
12. If "Shunt" was entered above, the system responds with...

```
Shunt type: current info
Shunt type (50mv or 100mv):
```

13. Type ***50mv*** or ***100mv*** to specify the shunt size connected to the input associated to this channel. Then press ***ENTER***.
14. If "Current" was entered above, the system responds with...

```
4-20 mA signal: current info
4-20 mA signal (Y or N):
```

15. Type ***Y*** if this analog channel monitors a remote measuring module with a 4-20 ma output. Type ***N*** if this analog channel monitors any other signal. Then press ***ENTER***.

Note: *If **Y** is entered, the analog channel will give a FAIL reading if the monitored signal drops below 2 mA.*

16. If "Voltage" was entered above, the system responds with...

```
Full Scale Output: current info
Enter the transducer full-scale output
in Volts:
```

17. Type the value (in volts) of the maximum voltage to be measured by this channel.
18. If "Shunt", "Current", "Voltage", or "None" was entered above as the "Transducer Type", the system responds with...

```
Scale Factor: current info
Scale Factor:
```

19. Type the required scale factor (20000 maximum), then press ***ENTER***.
20. The system responds with...

```
Monitor type: current info
Monitor type:
```

21. This parameter applies only to TL1 commands/messages. Type the name of the unit (10 characters maximum) that the above alarms are measured in (ex. VOLTDC, CURDC, etc.), then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Table 6-1.
22. The system responds with...

```
Monitor Value Format: current info
Set monitor value format to integer(I)
or decimal(D):
```

23. This parameter applies only to TL1 commands/messages. Type I if the monitored value (monval) is a decimal integer. Type D if the monitored value (monval) is an unrestricted decimal number. Then press ***ENTER***.
24. The system responds with...

```
Polarity: <present setting>
Polarity (+, -)?:
```

25. Type '+' (plus symbol) for Positive(default) polarity. Type '-' (minus symbol) for Negative polarity
26. The system responds with...

```
Alarm Limit Mode: N
Alarm Limit Mode (N or B) ?
```

27. 27) Type 'N' for 'Normal' operation.
    Type 'G' for 'Global' command operation
    Then press <ENTER>
28. The system responds with...

    ```
    Limit 1 Enabled: current info
    Limit 1 Enabled (Y or N):
    ```

29. Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
30. The system responds with...

    ```
    Limit 1 Value: current info
    Limit 1 Value:
    ```

31. Type the required value of the first alarm setting (5 digits, 20000 maximum), then press ***ENTER***.
32. The system responds with...

    ```
    Limit 1 Type: current info
    Limit 1 Type is High or Low (H or L):
    ```

33. Type ***H*** if the first alarm setting is a high limit and ***L*** if the first alarm setting is a low limit, then press ***ENTER***.
34. The system responds with...

    ```
    Limit 1 Name: current info
    Limit 1 Name:
    ```

35. Type the desired name of the first alarm setting (10 characters maximum), then press ***ENTER***.
36. The system responds with...

    ```
    Limit 1 Notification Code: current info
    Limit 1 Notification Code:
    ```

37. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm
38. The system responds with...

    ```
    Limit 1 Service Effect Code: current
    info
    Limit 1 Service Effect Code:
    ```

39. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required
40. The system responds with...

    ```
    Alarm Class Number:
    ```

41. Type the desired alarm class number associated with the first alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
42. The system responds with...

    ```
    Condition Type: current info
    Condition Type:
    ```

43. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
44. The system responds with...

    ```
    Condition Description: current info
    Condition Description:
    ```

45. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
46. The system responds with...

    ```
    Limit 2 Enabled: current info
    Limit 2 Enabled (Y or N):
    ```

47. Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
48. The system responds with...

    ```
    Limit 2 Value: current info
    Limit 2 Value:
    ```

49. Type the required value of the second alarm setting (5 digits, 20000 maximum), then press ***ENTER***.
50. The system responds with...

    ```
    Limit 2 Type: current info
    Limit 2 Type is High or Low (H or L):
    ```

51. Type ***H*** if the second alarm setting is a high limit and ***L*** if the second alarm setting is a low limit, then press ***ENTER***.
52. The system responds with...

    ```
    Limit 2 Name: current info
    Limit 2 Name:
    ```

53. Type the desired name of the second alarm setting (10 characters maximum), then press ***ENTER***.
54. The system responds with...

```
Limit 2 Notification Code: current info
Limit 2 Notification Code:
```

55. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

56. The system responds with...

```
Limit 2 Service Effect Code: current
info
Limit 2 Service Effect Code:
```

57. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

58. The system responds with...

```
Alarm Class Number:
```

59. Type the desired alarm class number associated with the second alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.

60. The system responds with...

```
Condition Type: current info
Condition Type:
```

61. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

62. The system responds with...

```
Condition Description: current info
Condition Description:
```

63. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

64. The system responds with...

```
Limit 3 Enabled: current info
Limit 3 Enabled (Y or N):
```

65. Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.

66. The system responds with...

```
Limit 3 Value: current info
Limit 3 Value:
```

67. Type the required value of the third alarm setting (5 digits, 20000 maximum), then press ***ENTER***.

68. The system responds with...

```
Limit 3 Type: current info
Limit 3 Type is High or Low (H or L):
```

69. Type ***H*** if the third alarm setting is a high limit and ***L*** if the third alarm setting is a low limit, then press ***ENTER***.

70. The system responds with...

```
Limit 3 Name: current info
Limit 3 Name:
```

71. Type the desired name of the third alarm setting (10 characters maximum), then press ***ENTER***.

72. The system responds with...

```
Limit 3 Notification Code: current info
Limit 3 Notification Code:
```

73. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

74. The system responds with...

```
Limit 3 Service Effect Code: current
info
Limit 3 Service Effect Code:
```

75. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

76. The system responds with...

```
Alarm Class Number:
```

77. Type the desired alarm class number associated with the third alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.

78. The system responds with...

```
Condition Type: current info
Condition Type:
```

79. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

80. The system responds with...

```
Condition Description: current info
Condition Description:
```

81. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

82. The system responds with...

```
Limit 4 Enabled: current info
Limit 4 Enabled (Y or N):
```

83. Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.

84. The system responds with...

```
Limit 4 Value: current info
Limit 4 Value:
```

85. Type the required value of the fourth alarm setting (5 digits, 20000 maximum), then press ***ENTER***.

86. The system responds with...

```
Limit 4 Type: current info
Limit 4 Type is High or Low (H or L):
```

87. Type ***H*** if the fourth alarm setting is a high limit and ***L*** if the fourth alarm setting is a low limit, then press ***ENTER***.

88. The system responds with...

```
Limit 4 Name: current info
Limit 4 Name:
```

89. Type the desired name of the fourth alarm setting (10 characters maximum), then press ***ENTER***.

90. The system responds with...

```
Limit 4 Notification Code: current info
Limit 4 Notification Code:
```

91. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

92. The system responds with...

```
Limit 4 Service Effect Code: current
info
Limit 4 Service Effect Code:
```

93. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

94. The system responds with...

```
Alarm Class Number:
```

95. Type the desired alarm class number associated with the fourth alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.

96. The system responds with...

```
Condition Type: current info
Condition Type:
```

97. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

98. The system responds with...

```
Condition Description: current info
Condition Description:
```

99. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

100. The system responds with...

```
Unit Text: current info
Unit Text:
```

101. Type the name of the unit (4 characters maximum) that the above alarms are measured in (ex. volt, amp, etc.), then press ***ENTER***.

102. The system responds with...

```
Off Delay Time: current info
Off Delay Time:
```

103. Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

104. The system responds with...

```
On Delay Time: current info
On Delay Time:
```

105. Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

106. The system responds with...

```
Save changes (Y or N):
```

107. Type ***Y*** if the above entered data is to be saved in the current analog channel configuration and ***N*** if not, then press ***ENTER***.

108. The system will display the second analog channel configuration. Enter the required data for each analog channel as described above until the system displays the default configuration of the first binary channel.

Configuring Binary Channels

Refer to the worksheets (or copies of) located at the end of "Installing LMS1000" as a guide in programming the various channels associated with the system.

Note: *This information can also be programmed through the command CONFIG B_ which is described later in this section.*

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

Note: *The "Alarm Condition" attribute of the MCA Interface channels is not configurable. The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

1. After the system responds with the first binary channel default configuration, the following is displayed...

```
Channel active (Y or N):
```

2. Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.

3. If "N" was entered, the system displays another binary channel configuration. If "Y" was entered, the system allows the default configuration information of the current binary channel to be changed as shown below.

4. The system will respond with...

```
Name: current info
Name:
```

5. Type the desired name for this binary channel (30 characters maximum), then press ***ENTER***.

6. The system responds with...

```
Sub-access Identifier: current info
Sub-access Identifier:
```

7. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.

8. The system responds with...

```
System Alarm Report mode: current info
System Alarm Report mode (Y or N):
```

9. Type ***Y*** if the system is required to initiate an alarm report if the alarm condition occurs on this channel and ***N*** if not, then press ***ENTER***.

10. The system responds with...

```
Condition Type: current info
Condition Type:
```

11. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

12. The system responds with...

```
Condition Description: current info
Condition Description:
```

13. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

14. The system responds with...

```
Notification Code: current info
Notification Code:
```

15. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

16. The system responds with...

```
Service Effect Code: current info
Service Effect Code:
```

17. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

18. The system responds with...

```
Alarm Condition: current info
Alarm Condition (CC or CO):
```

19. Type the characters ***CC*** or ***CO*** which represents the condition required to activate an alarm, then press ***ENTER***.

20. The system responds with...

```
Alarm Class Number:
```

21. Type the desired alarm class number associated with this channel, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.

22. The system responds with...

```
Off Delay Time: current info
Off Delay Time:
```

23. Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

    Note: *The timing involved in the operation of the rectifier sequencing feature will be affected if the alarm delay attributes for the binary channels selected to control the sequencer are configured. Configuring the "On Delay" or "Off Delay" for the AC Fail / Transfer input or Standby On / Proper Operate input will postpone detection (signals may have already been detected by the transfer device) of an AC Failure or Proper Operate signal by the system rectifier sequencing software.*

24. The system responds with...

```
On Delay Time: current info
On Delay Time:
```

25. Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

    Note: *The timing involved in the operation of the rectifier sequencing feature will be affected if the alarm delay attributes for the binary channels selected to control the sequencer are configured. Configuring the "On Delay" or "Off Delay" for the AC Fail / Transfer input or Standby On / Proper Operate input will postpone detection (signals may have already been detected by the transfer device) of an AC Failure or Proper Operate signal by the system rectifier sequencing software.*

26. The system responds with...

```
Save changes (Y or N):
```

27. Type ***Y*** if the above entered data is to be saved in the current binary channel configuration and ***N*** if not, then press ***ENTER***.

28. The system will display the second binary channel configuration. Enter the required data for each binary channel as described above until the system displays the

default configuration of the first energy management channel.

Configuring Energy Management Channels (if Energy Management Software Option furnished)

Refer to the worksheets (or copies of) located at the end of "Installing LMS1000" as a guide in programming the various channels associated with the system.

Note: *This information can also be programmed through the command CONFIG E_ which is described later in this section.*

1. After the system responds with the first energy management channel default configuration, the following is displayed...

   ```
   Channel active (Y or N):
   ```

2. Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.

3. If "N" was entered, the system displays another energy management channel configuration. If "Y" was entered, the system allows the default configuration information of the current energy management channel to be changed as shown below.

4. The system responds with...

   ```
   Name: current info
   Name:
   ```

5. Type the desired name for this energy management channel (30 characters maximum), then press ***ENTER***.

6. The system responds with...

   ```
   (name entered in step #4) Shunt =
   current info
   (name entered in step #4) Shunt =
   ```

7. Type the name of the analog channel connected to the output shunt of the rectifier connected to this channel, then press ***ENTER***.

   or

8. Type the name of the analog channel automatically mapped to monitor this PCUs output current, then press ***ENTER***. Refer to the Operation section in the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

9. If the analog channel selected in step 7) is <u>not</u> associated to a PCU shunt, the system responds with...

   ```
   (name entered in step #4) Capacity:
   current info
   (name entered in step #4) Capacity:
   ```

10. Type the rated full load input capacity (in amperes) of the rectifier connected to this channel (5 digits maximum), then press ***ENTER***.

    Note: *This parameter is not user configurable for PCUs, this value is automatically obtained by the software.*

11. If the analog channel selected in step 7) is <u>not</u> associated to a PCU shunt, the system responds with...

    ```
    (name entered in step #4) RFA = current
    info
    (name entered in step #4) RFA =
    ```

12. Type the name of the binary channel connected to the RFA alarm circuit of the rectifier connected to this channel, then press ***ENTER***.

    Note: *This parameter is not user configurable for PCUs, this value is automatically obtained by the software.*

    Note: *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port option, Energy Management RFA's are summed together and total number of rectifiers failures is passed to the MCA and used in determining 'Rectifier Minor' and 'Rectifier Major' alarms. This only applies to Energy Management channels not associated to Vortex/NETSURE PCU's.*

13. If the analog channel selected in step 7) is <u>not</u> associated to a PCU shunt, the system responds with...

    ```
    (name entered in step #4) TR lead =
    current info
    (name entered in step #4) TR lead =
    ```

14. Type the name of the relay channel connected to the TR or RCC leads of the rectifier connected to this channel, then press ***ENTER***.

    Note: *Only use relay channel on circuit cards installed in the 586505000/586505500 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay. DO NOT use relay circuit cards in 586505000/586505500 Expansion Cabinets or 582140000/582140001/582126100 Secondary Bays for controlling rectifiers.*

    Note: *This parameter is not user configurable for PCUs.*

15. The system responds with...

    ```
    Rectifier On when Standby ON (Y or N):
    ```

16. Type ***Y*** if it is required to have the rectifier/PCU connected to this channel to be turned on if a standby source is supplying power to the rectifier/PCU and ***N*** if not, then press ***ENTER***.

17. The system responds with...

```
Save changes (Y or N):
```

18. Type ***Y*** if the above entered data is to be saved in the current energy management channel configuration and ***N*** if not, then press ***ENTER***.

19. The system will display the second energy management channel configuration. Enter the required data for each energy management channel as described above until the system displays the default configuration of the first function channel.

Configuring Function Channels

Refer to the worksheets (or copies of) located at the end of "Installing LMS1000" as a guide in programming the various channels associated with the system.

Note: *This information can also be programmed through the command CONFIG F_ which is described later in this section.*

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

1. After the system responds with the first function channel default configuration, the following is displayed...

```
Channel active (Y or N):
```

2. Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.

3. If "N" was entered, the system displays another function channel configuration. If "Y" was entered, the system allows the default configuration information of the current function channel to be changed as shown below.

4. The system responds with...

```
Name: current info
Name:
```

5. Type the desired name for this function channel (30 characters maximum), then press ***ENTER***.

6. The system responds with...

```
Sub-access Identifier: current info
Sub-access Identifier:
```

7. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.

8. The system responds with...

```
System Alarm Report mode: current info
System Alarm Report mode (Y or N):
```

9. Type ***Y*** if the system is required to initiate an alarm report if an alarm limit is exceeded on this channel and ***N*** if not, then press ***ENTER***.

10. The system responds with...

```
Monitor type: current info
Monitor type:
```

11. This parameter applies only to TL1 commands/messages. Type the name of the unit (10 characters maximum) that the above alarms are measured in (ex. VOLTDC, CURDC, etc.), then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Table 6-1.

12. The system responds with...

```
Monitor Value Format: current info
Set monitor value format to integer(I)
or decimal(D):
```

13. This parameter applies only to TL1 commands/messages. Type I if the monitored value (monval) is a decimal integer. Type D if the monitored value (monval) is an unrestricted decimal number. Then press ***ENTER***.

14. The system responds with...

```
Limit 1 Enabled: current info
Limit 1 Enabled (Y or N):
```

15. Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.

16. The system responds with...

```
Limit 1 Value: current info
Limit 1 Value:
```

17. Type the required value of the first alarm setting (5 digits, 99999 maximum), then press ***ENTER***.

18. The system responds with...

```
Limit 1 Type: current info
Limit 1 Type is High or Low (H or L):
```

19. Type ***H*** if the first alarm setting is a high limit and ***L*** if the first alarm setting is a low limit, then press ***ENTER***.

20. The system responds with...

```
Limit 1 Name: current info
Limit 1 Name:
```

21. Type the desired name of the first alarm setting (10 characters maximum), then press ***ENTER***.

22. The system responds with...

```
Limit 1 Notification Code: current info
Limit 1 Notification Code:
```

23. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

24. The system responds with...

```
Limit 1 Service Effect Code: current
info
Limit 1 Service Effect Code:
```

25. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

26. The system responds with...

```
Alarm Class Number:
```

27. Type the desired alarm class number associated with the first alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.

28. The system responds with...

```
Condition Type: current info
Condition Type:
```

29. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

30. The system responds with...

```
Condition Description: current info
Condition Description:
```

31. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

32. The system responds with...

```
Limit 2 Enabled: current info
Limit 2 Enabled (Y or N):
```

33. Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.

34. The system responds with...

```
Limit 2 Value: current info
Limit 2 Value:
```

35. Type the required value of the second alarm setting (5 digits, 99999 maximum), then press ***ENTER***.

36. The system responds with...

```
Limit 2 Type: current info
Limit 2 Type is High or Low (H or L):
```

37. Type ***H*** if the second alarm setting is a high limit and ***L*** if the second alarm setting is a low limit, then press ***ENTER***.

38. The system responds with...

```
Limit 2 Name: current info
Limit 2 Name:
```

39. Type the desired name of the second alarm setting (10 characters maximum), then press ***ENTER***.

40. The system responds with...

```
Limit 2 Notification Code: current info
Limit 2 Notification Code:
```

41. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

42. The system responds with...

```
Limit 2 Service Effect Code: current
info
Limit 2 Service Effect Code:
```

43. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

44. The system responds with...

```
Alarm Class Number:
```

45. Type the desired alarm class number associated with the second alarm limit, then press ***ENTER***. Alarm classes are

specified with the numbers 0 through 8, with 0 representing no alarm class.

46. The system responds with...

```
Condition Type: current info
Condition Type:
```

47. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

48. The system responds with...

```
Condition Description: current info
Condition Description:
```

49. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

50. The system responds with...

```
Limit 3 Enabled: current info
Limit 3 Enabled (Y or N):
```

51. Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.

52. The system responds with...

```
Limit 3 Value: current info
Limit 3 Value:
```

53. Type the required value of the third alarm setting (5 digits, 99999 maximum), then press ***ENTER***.

54. The system responds with...

```
Limit 3 Type: current info
Limit 3 Type is High or Low (H or L):
```

55. Type ***H*** if the third alarm setting is a high limit and ***L*** if the third alarm setting is a low limit, then press ***ENTER***.

56. The system responds with...

```
Limit 3 Name: current info
Limit 3 Name:
```

57. Type the desired name of the third alarm setting (10 characters maximum), then press ***ENTER***.

58. The system responds with...

```
Limit 3 Notification Code: current info
Limit 3 Notification Code:
```

59. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

60. The system responds with...

```
Limit 3 Service Effect Code: current info
Limit 3 Service Effect Code:
```

61. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

62. The system responds with...

```
Alarm Class Number:
```

63. Type the desired alarm class number associated with the third alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.

64. The system responds with...

```
Condition Type: current info
Condition Type:
```

65. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

66. The system responds with...

```
Condition Description: current info
Condition Description:
```

67. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

68. The system responds with...

```
Limit 4 Enabled: current info
Limit 4 Enabled (Y or N):
```

69. Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
70. The system responds with...

    ```
    Limit 4 Value: current info
    Limit 4 Value:
    ```

71. Type the required value of the fourth alarm setting (5 digits, 99999 maximum), then press ***ENTER***.
72. The system responds with...

    ```
    Limit 4 Type: current info
    Limit 4 Type is High or Low (H or L):
    ```

73. Type ***H*** if the fourth alarm setting is a high limit and ***L*** if the fourth alarm setting is a low limit, then press ***ENTER***.
74. The system responds with...

    ```
    Limit 4 Name: current info
    Limit 4 Name:
    ```

75. Type the desired name of the fourth alarm setting (10 characters maximum), then press ***ENTER***.
76. The system responds with...

    ```
    Limit 4 Notification Code: current info
    Limit 4 Notification Code:
    ```

77. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

78. The system responds with...

    ```
    Limit 4 Service Effect Code: current
    info
    Limit 4 Service Effect Code:
    ```

79. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

80. The system responds with...

    ```
    Alarm Class Number:
    ```

81. Type the desired alarm class number associated with the fourth alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
82. The system responds with...

    ```
    Condition Type: current info
    Condition Type:
    ```

83. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
84. The system responds with...

    ```
    Condition Description: current info
    Condition Description:
    ```

85. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
86. The system responds with...

    ```
    Unit Text: current info
    Unit Text:
    ```

87. Type the name of the unit (4 characters maximum) that the above alarms are measured in (ex. volt, amp, etc.), then press ***ENTER***.
88. The system responds with...

    ```
    Off Delay Time: current info
    Off Delay Time:
    ```

89. Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

90. The system responds with...

    ```
    On Delay Time: current info
    On Delay Time:
    ```

91. Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

92. The system responds with...

```
Save changes (Y or N):
```

93. Type ***Y*** if the above entered data is to be saved in the current function channel configuration and ***N*** if not, then press ***ENTER***.
94. If "Y" was entered above, the system responds with...

```
Enter Program Line:
```

95. Type the program line (79 characters maximum) which determines the input value of this channel, then press ***ENTER***. Program lines are discussed earlier in this section.

    Note: *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port option, channels F64 and F63 are used to provide the values to the Power System MCA for 'Total Rectifier Output' and 'External Distribution Load' status readings respectively. Any value assigned/calculated in the program lines of these channels will be passed to the MCA and summed into the 'Total Charger Output' and 'Total Load Current' respectively (as viewed on LMS1000 channels A9902 and A9904).*

96. The system will display the second function channel configuration. Enter the required data for each function channel as described above until the system displays the default configuration of the first LED channel.

Configuring LED Channels

Refer to the worksheets (or copies of) located at the end of "Installing LMS1000" as a guide in programming the various channels associated with the system.

Note: *This information can also be programmed through the command CONFIG L_ which is described later in this section.*

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

1. After the system responds with the first LED channel default configuration, the following will be displayed...

```
Channel active (Y or N):
```

2. Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.
3. If "N" was entered, the system displays another LED channel configuration. If "Y" was entered, the system allows the default configuration information of the current LED channel to be changed as shown below.
4. The system responds with...

```
Name: current info
Name:
```

5. Type the desired name for this LED channel (30 characters maximum), then press ***ENTER***.
6. The system responds with...

```
Color: current info
Color (Red, Green, or Amber):
```

7. Type ***Red***, ***Green***, or ***Amber*** to specify the color the LED illuminates, then press ***ENTER***.
8. The system responds with...

```
Sub-access Identifier: current info
Sub-access Identifier:
```

9. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.
10. The system responds with...

```
Alarm Type: current info
Alarm Type (Y or N):
```

11. Type ***Y*** if the alarm condition determined by this channel is required to be recorded in the alarm log (required if System Alarm Reporting is desired for this channel, and/or an alarm class of 1 through 8 is assigned to this channel) when it is activated and ***N*** if not, then press ***ENTER***.
12. If "Y" was entered above, the system responds with...

```
System Alarm Report mode: current info
System Alarm Report mode (Y or N):
```

13. Type ***Y*** if the system is required to initiate an alarm report if this channel alarms and ***N*** if not, then press ***ENTER***.
14. If "Y" was entered above for "Alarm Type", the system responds with...

```
Alarm Class Number:
```

15. Type the desired alarm class number associated with this channel, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
16. If "Y" was entered above for the ALARM TYPE parameter, the system responds with...

```
Condition Type: current info
Condition Type:
```

17. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

18. The system responds with...

```
Condition Description: current info
Condition Description:
```

19. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

20. If "Y" was entered above for the ALARM TYPE parameter, the system responds with...

```
Notification Code: current info
Notification Code:
```

21. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

22. If "Y" was entered above for the ALARM TYPE parameter, the system responds with...

```
Service Effect Code: current info
Service Effect Code:
```

23. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

24. The system responds with...

```
Control Type: current info
Control Type:
```

25. This parameter applies only to TL1 commands/messages. Type the name of the NMA system external control entity (10 characters maximum) that this channel is controlling, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to Appendix G of TR-NWT-000833, issue 5.

26. The system responds with...

```
Off Delay Time: current info
Off Delay Time:
```

27. Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

28. The system responds with...

```
On Delay Time:  current info
On Delay Time:
```

29. Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

30. The system responds with...

```
Save changes (Y or N):
```

31. Type ***Y*** if the above entered data is to be saved in the current LED channel configuration and ***N*** if not, then press ***ENTER***.

32. If "Y" was entered above, the system responds with...

```
Enter Program Line:
```

33. Type the program line (79 characters maximum) which determines when the LED illuminates, then press ***ENTER***. Program lines are discussed earlier in this section.

    Note: *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port option, channel L7 is dedicated to provide an 'External Fuse Alarm' indication and channel L8 is dedicated to provide an 'External AC Fail Alarm' indication to the Power System MCA. Any state generated by the program lines of these channels will be passed to the MCA as an 'External Fuse Alarm' and an 'External AC Fail Alarm' indication respectively.*

34. The system will display the second LED channel configuration. Enter the required data for each LED

channel as described above until the system displays the default configuration of the first relay channel.

Configuring Relay Channels

Refer to the worksheets (or copies of) located at the end of "Installing LMS1000" as a guide in programming the various channels associated with the system.

Note: *This information can also be programmed through the command CONFIG R_ which is described later in this section.*

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

1. After the system responds with the first relay channel default configuration, the following is displayed...

   ```
   Channel active (Y or N):
   ```

2. Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.

3. If "N" was entered, the system displays another relay channel configuration. If "Y" was entered, the system allows the default configuration information of the current relay channel to be changed as shown below.

4. The system responds with...

   ```
   Name: current info
   Name:
   ```

5. Type the desired name for this relay channel (30 characters maximum), then press ***ENTER***.

6. The system responds with...

   ```
   Sub-access Identifier: current info
   Sub-access Identifier:
   ```

7. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.

8. The system responds with...

   ```
   Alarm Type: current info
   Alarm Type (Y or N):
   ```

9. Type ***Y*** if the alarm condition determined by this channel is required to be recorded in the alarm log (required if System Alarm Reporting or TL1 report messaging is desired for this channel, and/or an alarm class of 1 through 8 is assigned to this channel) when it is activated and ***N*** if not, then press ***ENTER***.

10. If "Y" was entered above, the system responds with...

    ```
    System Alarm Report mode: current info
    System Alarm Report mode (Y or N):
    ```

11. Type ***Y*** if the system is required to initiate an alarm report if this channel alarms and ***N*** if not, then press ***ENTER***.

12. If "Y" was entered above for "Alarm Type", the system responds with...

    ```
    Alarm Class Number:
    ```

13. Type the desired alarm class number associated with this channel, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.

14. If "Y" was entered above for the ALARM TYPE parameter, the system responds with...

    ```
    Condition Type: current info
    Condition Type:
    ```

15. This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

16. The system responds with...

    ```
    Condition Description: current info
    Condition Description:
    ```

17. This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).

18. If "Y" was entered above for the ALARM TYPE parameter, the system responds with...

    ```
    Notification Code: current info
    Notification Code:
    ```

19. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***.

    CR - critical alarm NA - not alarmed
    MJ - major alarm NR - not reported when event occurs
    MN - minor alarm

20. If "Y" was entered above for the ALARM TYPE parameter, the system responds with...

    ```
    Service Effect Code: current info
    Service Effect Code:
    ```

21. This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***.

    SA = service-affecting condition, immediate action required
    NSA = nonservice-affecting condition, action required

22. The system responds with...

    ```
    Affected by ACO: current info
    Affected by ACO (Y or N):
    ```

23. Type the characters ***Y*** or ***N*** which represent if the alarm can be cut off, then press ***ENTER***. Y=yes, ACO enabled, N=NO, ACO disabled

24. The system responds with...

    ```
    Cycle Freq (min): current info
    Cycle Freq (min):
    ```

25. Type the required cycle frequency of the relay channel (0-1440 minutes), then press ***ENTER***. When a relay is energized, the system can be programmed to de-energize the relay at a selected time interval. This time interval is determined by the relay's "cycle frequency". This feature resets external alarm logic that requires an open to close transition for alarming. During a relay alarm condition, the relay remains energized for the time duration determined by the value of the relay's cycle frequency. Once this time period transpires, the system de-energizes the relay for 15 seconds. The system then re-energizes the relay if the alarm condition still exists.

    If the relay channel is set to be affected by ACO, the cycle frequency is also used to automatically release the alarm cut-off feature at a selected time interval determined by the cycle frequency. The system automatically performs the equivalent of a CLR ACO command at the end of the "cycle frequency". To disable these features, set the "cycle frequency" to zero.

26. The system responds with...

    ```
    Control Type: current info
    Control Type:
    ```

27. This parameter applies only to TL1 commands/messages. Type the name of the NMA system external control entity (10 characters maximum) that this channel is controlling, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to Appendix G of TR-NWT-000833, issue 5.

28. The system responds with...

    ```
    Off Delay Time: current info
    Off Delay Time:
    ```

29. Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

30. The system responds with...

    ```
    On Delay Time: current info
    On Delay Time:
    ```

31. Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition.

    * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.

32. The system responds with...

    ```
    Save changes (Y or N):
    ```

33. Type ***Y*** if the above entered data is to be saved in the current relay channel configuration and ***N*** if not, then press ***ENTER***.

34. If "Y" was entered above, the system responds with...

    ```
    Enter Program Line:
    ```

    Note: *A relay output assigned to an Energy Management channel cannot be controlled by a program line.*

35. Type the program line (79 characters maximum) which determines when the relay energizes, then press ***ENTER***. Program lines are discussed earlier in this section.

36. The system will display the second relay channel configuration. Enter the required data for each relay channel as described above.

Configuring the Number of Rings Before Answer

Note: *This information can also be programmed through the command SET ANSWER which is described in "Commands" in the User Instructions (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system*

1. The system then displays the number of rings before answer default configuration as shown next...

   ```
   Rings before answer: current info
   ```

```
Enter New #:
```

2. Type the desired number of rings that the system waits before answering an incoming telephone call (99 rings maximum), then press the ***ENTER*** key. The new value is displayed.

Configuring the Users

Note: *This information can also be programmed through the command SET USERS which is described later in this section.*

Note: *The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. Add these channels to the User Group as necessary.*

1. The system responds with the first user default configuration, followed by...

```
User active (Y or N):
```

2. Type ***Y*** if the user is required to be active and ***N*** if not, then press ***ENTER***.

   Note: *This prompt is not displayed if the logged on user is modifying his own user configuration. A user cannot de-activate his own configuration.*

3. If "N" was entered, the system displays another user configuration. If "Y" was entered, the system allows the default configuration information of the current user to be changed as shown below.

4. The system responds with...

```
Name: current info
Name:
```

5. Type the desired name for this user (30 characters maximum unless used with TL1, then 10 characters maximum), then press ***ENTER***. The system uses this name to identify various activities of the user such as when he accesses the system or changes a configuration of the system.

6. The system responds with...

```
Password: current info
Password:
```

7. Type the desired password for the user (8 characters maximum), then press ***ENTER***. Each user is programmed with a unique password that grants him access to a specific command level. Passwords are case sensitive, which means the system recognizes upper and lower case characters differently. Type the password exactly as it is to be used. There is no provision for changing access levels once a person is logged on to the system. Additionally, a user cannot change his own password unless he is programmed for access level 6.

   Note: *If the user is to access the system through the TL1 port, the user's password must contain two non-alpha characters. One of these must be a symbol. ([%], [#], and [+] are the only valid symbols).*

8. The system responds with...

```
Access Level: current info
Access Level (1-6):
```

9. Type the desired access level (1-6) of the user, then press ***ENTER***. The access level determines which commands are available to a particular user. Level 6 allows the user to have access to all the commands.

   Note: *This prompt is not displayed if the logged on user is modifying his own user configuration. A user cannot change his own access level.*

10. The system responds with...

```
Callback: current info
Callback (Y or N):
```

11. Type ***Y*** if the user requires the callback feature and ***N*** if not, then press ***ENTER***. The callback feature allows additional system security when accessing the system via its modem. After a user calls the system and enters his password, the system will hang-up and call the user back at the preprogrammed designated phone number.

12. The system responds with...

```
Primary Phone: current info
Primary Phone:
```

13. Type the primary phone number of the user that the system will use for callbacks, System Alarm Reports, and User Reports (20 characters maximum), then press ***ENTER***.

    Note: *If the alarm report is to be initiated through a pager, set the user phone number to that of the paging system. If the remote paging system requires a Personal Identification Number (PIN) to gain access, then the PIN must be entered as part of the user phone number. This is done by entering the pager system phone number followed by the character 'B' followed by the PIN and any terminating character required (for example, '#').*

14. The system responds with...

```
Valid Times for Primary Phone
```

15. The primary phone number or primary Email will be used by the system only during valid days and hours, as programmed below.
16. The system responds with...

```
From Day: current info
From Day:
```

17. Type the beginning day of the week the user wants to be contacted at the primary phone number for callbacks and primary phone number or primary Email for System Alarm Reports and User Reports (1-7, Sunday=1), then press ***ENTER***.
18. The system responds with...

```
Thru Day: current info
Thru Day:
```

19. Type the ending day of the week the user wants to be contacted at the primary phone number for callbacks and primary phone number or primary Email for System Alarm Reports and User Reports (1-7, Sunday=1), then press ***ENTER***.
20. The system responds with...

```
From Hour: current info
From Hour:
```

21. Type the beginning hour of the day that the user wants to be contacted at the primary phone number for callbacks and primary phone number or primary Email for System Alarm Reports and User Reports (00-23), then press ***ENTER***.
22. The system responds with...

```
Thru Hour: current info
Thru Hour:
```

23. Type the ending hour of the day the user wants to be contacted at the primary phone number for callbacks and primary phone number or primary Email for System Alarm Reports and User Reports (00-23), then press ***ENTER***.

    Note: *EXAMPLE: If 16 is entered, the primary phone # or primary Email is used through 16:59.*

24. The system responds with...

```
Alternate Phone: current info
Alternate Phone:
```

25. Type an alternate phone number the system will use for callbacks, System Alarm Reports, and User Reports when the current date or time is not valid as programmed above (20 characters maximum), then press ***ENTER***.

    Note: *If System Alarm Reports and User Reports are to be initiated through a pager, do not enter an alternate phone number.*

26. The system responds with...

```
Primary E-mail: current info
Primary E-mail:
```

27. Type the Email address the system is to use for System Alarm Reports and User Reports during the "Valid Days & Hours for Primary Phone Number", then press ***ENTER***.
28. The system responds with...

```
Alternate E-mail: current info
Alternate E-mail:
```

29. Type the Email address the system is to use for System Alarm Reports and User Reports outside of the "Valid Days & Hours for Primary Phone Number", then press ***ENTER***.
30. The system responds with...

```
Report Device: current info
Report Device (Modem, Ethernet, X25 [if
TL1/x.25 option installed], or Telnet
[if TL1 over Ethernet option
installed]):
```

31. Type the desired Report Device (select Modem, Ethernet, X25, or Telnet) that the system uses to issue System Alarm Reports and User Reports, then press ***ENTER***.

    Note: *"Modem" = LMS1000 Modem*

    "Ethernet" = Email notification via Ethernet Port
    "X25" = TL1/X.25 Port
    "Telnet" = TL1 over Ethernet Port

32. If "Modem" was typed above as the Report Device, the system responds with...

```
Report Mode: current info
Report Mode (Off, Pager, M300, M1200,
M2400,M9600, M28800, M33600, or M56000):
```

    Type the desired mode (select off, pager, modem[bits/s] that the system uses to send System Alarm Reports and User Reports, then press ***ENTER***.

    Note: *If the report mode is set to pager, enter the required information for the primary phone number, unit pager code, and pager delay.*

    If "Ethernet" was typed above as the Report Device, the system responds with...

```
Report Mode: current info
Report Mode (Off or E-mail):
```

Type ***Off*** or ***E-mail***. OFF = alarm reports are not processed. E-mail = System Alarm Reports and User Reports sent via Email. Then press ***ENTER***.
If "X25" or "Telnet" was typed above as the Report Device, the system responds with...

```
Report Mode: current info
Report Mode (Off or TL1):
```

Type ***Off*** or ***TL1***. OFF = alarm reports are not processed. TL1 = TL1 report messages processed via the TL1 port. Then press ***ENTER***.

33. The system responds with...

```
Report Retry Time: current info
Report Retry Time:
```

34. Type the number of minutes that the system will wait before attempting to contact the user with a callback, User Report, or TL1 report message if the prior attempt failed (0-1440 minutes), then press ***ENTER***. Zero represents no retry. (This retry time has no effect on System Alarm Reporting)

35. If "X25" or "Telnet" was typed above as the Report Device, the system responds with...

```
TL1 Report Condition Interval: current
info
TL1 Report Condition Interval:
```

36. This parameter applies only to TL1 commands/messages. Type the number of minutes (as referenced from midnight each day) that the system will wait before contacting the user with another Report Condition message (0-1440 minutes), then press ***ENTER***. As an example, if a time period of 90 minutes is specified, the system will report at Midnight, 1:30 am, 3:00 am etc. A value of '0' disables sending of Report Condition messages.

37. If "Modem" or "Email" was typed above as the Report Device, the system responds with...

```
Occurred Alarm Report: current info
Occurred Alarm Report (Y or N):
```

38. Type ***Y*** if the user requires an occurred "User Report" and ***N*** if not, then press ***ENTER***. An occurred "User Report" is a report of any new alarms that have occurred on the user's channels.

39. If "Modem" or "Email" was typed above as the Report Device, the system responds with...

```
Retired Alarm Report: current info
Retired Alarm Report (Y or N):
```

40. Type ***Y*** if the user requires a retired "User Report" and ***N*** if not, then press ***ENTER***. A retired "User Report" is a report of any alarms that have cleared on the user's channels.

41. If "Modem" or "Email" was typed above as the Report Device, the system responds with...

```
Persistent Alarm Report: current info
Persistent Alarm Report (Y or N):
```

42. Type ***Y*** if the user requires a persistent "User Report" and ***N*** if not, then press ***ENTER***. A persistent "User Report" is a periodic report of any alarms that still exist on the user's channels.

43. If "Y" was entered above, the system responds with...

```
Persistent Alarm Report Period: current
info
Persistent Alarm Report Period:
```

44. Type the number of minutes (as referenced from midnight each day) that the system will wait before contacting the user with another persistent "User Report" (0-1440 minutes), then press ***ENTER***. As an example, if a time period of 90 minutes is specified, the system will report at Midnight, 1:30 am, 3:00 am etc.

45. If "Modem" or "Email" was typed above as the Report Device, the system responds with...

```
Daily Report: current info
Daily Report (Y or N):
```

46. Type ***Y*** if the user requires a daily "User Report" and ***N*** if not, then press ***ENTER***.

47. If "Y" was entered above, the system responds with...

```
Daily Report Command: current info
Daily Report Command:
```

48. Type the standard system command or user programmable command (30 characters maximum) that the system will issue to generate the daily "User Report", then press ***ENTER***.

49. If "Y" was entered above, the system responds with...

```
Daily Report Time: current info
Daily Report Time:
```

50. Type the desired time that the user wants to be contacted with the daily "User Report" (format HH:MM), then press ***ENTER***.

51. The system responds with...

Note: *If "X25"or "Telnet" is selected as the REPORT DEVICE and "TL1" is selected as the REPORT MODE, the following statement appears if the user has any channels configured which do not belong to an Access Identifier group.*

```
The following channels will be removed
from the user's channel configuration
because they are not associated with an
access identifier:
Save changes (Y or N):
```

52. Type ***Y*** if the above entered data is to be saved in the current user configuration and ***N*** if not, then press ***ENTER***.
53. The system responds with...

    ```
    Edit User Channels (Y or N):
    ```

54. Type ***Y*** if it is desired to add or delete specific system channels from the user configuration and ***N*** if not, then press ***ENTER***. Channels which are a part of a user configuration are the only channels that the system will process for the above User Reports or TL1 report messages. Users configured to report via a TL1 network can only specify channels that have been configured as part of an access identifier.
55. If "Y" was entered above, the following will be displayed...

    ```
    Enter channel (e.g. A0012 or A0001-0006)
    or D to display.
    Add Channel:
    ```

56. Type ***D*** to display a complete list of channels in the user configuration.

    Type the number(s) of all additional channels to be added to the user configuration, then press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channels (e.g. A0001-0008, L0001-0012). To exit, press ***ENTER*** without specifying a channel.

    Note: *If "X25" or "Telnet" is selected as the REPORT DEVICE and "TL1" is selected as the REPORT MODE, the following statement appears if the user tries to add a channel(s) which does not belong to an Access Identifier group.*

    ```
    Channel not configured properly for TL1
    reporting.
    ```

57. The system responds with...

    ```
    Enter channel (e.g. A12 or A1-6) or D to
    display.
    Del Channel:
    ```

58. Type ***D*** to display a complete list of channels in the user configuration.

    Type the number(s) of the channels to be deleted from the user configuration, then press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channels (e.g. A0001-0008, L0001-0012). To exit, press ***ENTER*** without specifying a channel.

59. The system displays the second user configuration. Enter the required data for each user as described above.

Configuring System Alarm Reporting

Note: *This information can also be programmed through the command SET REPORT which is described later in this section.*

1. The system then lists the System Alarm Reporting default configuration, followed by...

   ```
   System Alarm Report Mode (Continuous,
   Single, or Off):
   ```

2. Type ***Single*** or ***Continuous*** if the system is required to initiate an alarm report if any system channel alarms, and ***Off*** if not.

   Note:
   Single = *System Alarm Report is considered successful if the system connects with a modem or valid Email address. (Alarm report transmitted once.)*
   Continuous = *System Alarm Report is considered successful if the user issues an ACKnowledgement. (The system continues to issue the report at an interval determined by the "retry time" until the ACK command is entered by the user.)*

3. The system responds with...

   ```
   User Calling Sequence:
   ```

4. Type the numbers (1-8), which correspond to individual users, in the required calling sequence, then press ***ENTER***. The user calling sequence lists the users in the order in which the system will attempt to call or Email to communicate an alarm report. Once the system notifies a user, the sequence is reset to the first user, ready for the next alarm report.

   Note: *A maximum of 20 digits can be entered.*

5. The system responds with...

   ```
   Retry Time:
   ```

6. Type the required retry time (0-1440 minutes, with 0 representing no report retry), then press ***ENTER***. The retry time is the time interval between the calling or Emailing of the last person designated in the user calling sequence list and the recalling or Emailing of the first user

in the sequence in the event of an unsuccessful attempt to report an alarm condition.

7. The system responds with...

```
Auto-Logoff Time (seconds):
```

8. Type the required auto-logoff time (30 to 600 seconds). If a user is remotely communicating with the system, and the system needs to issue an alarm report to a remote terminal, the system issues a priority message to the user, and automatically logs the user off. The auto-logoff time period is the interval the system waits with the pending report before issuing the priority message, and logging the user off.

This completes the configuration of the system using the SET SYSTEM command. The configuration can be checked and, if necessary, corrected at this time by re-entering the command SET SYSTEM or by using the separate commands described later in this section.

Setting Email Parameters

The following parameters must be set if you are sending System Alarm Reports and User Reports via Email. Also set the "IP Network Address", "IP Gateway Address", and "IP Netmask" using the commands IP ADDRESS, IP GATEWAY, and IP NETMASK. See your IT Department for these values.

PROCEDURE:

1. After logging onto the system, type ***SET EMAIL.*** Then press ***ENTER***.

```
Command <6>: SET EMAIL
```

2. The system responds with...

```
Command<6>: set email
Primary DNS Address : 0.0.0.0
Secondary DNS Address : 0.0.0.0
Local SMTP Server Address : 0.0.0.0
Email Return Address :

Enter Primary DNS Address :
```

3. Enter each parameter, and press ***ENTER***. See your IT Department for values. The SMTP server must be capable of relaying Emails outside of the domain. The Email return address must be on the same domain.

Configuring Groups

See "Configuring Channels into Groups" in the next section "SUBSEQUENT CONFIGURATION" of this section.

Setting User Timeout

This procedure shows the user how to change the length of time that the system will remain on line without a command, carriage return, or line feed being entered before terminating a communication session.

Note: *The TL1 port has a session timeout feature which operates independently from the user timeout feature.*

PROCEDURE:

1. After logging onto the system, type ***SET TIMEOUT.*** Then press ***ENTER***.

```
Command <6>: SET TIMEOUT
```

2. The system responds with...

```
User timeout: current info.
Enter new user timeout:
```

3. Type the desired timeout period (5 seconds minimum, 9999 seconds maximum), then press ***ENTER***. The timeout period is the amount of time that the system waits after being accessed and then left inactive before timing out and returning to the idle state. If the system was accessed remotely, the system will release the phone line after this time out period expires.

Setting WEB Interface

Refer to the OPERATING section in the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Setting the Battery Discharge Timer Feature (if required)

Refer to the OPERATING section in the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Setting SNMP

Setting IP Networking Parameters

Use the following commands to set the IP Networking parameters.

Unit TCP/IP Address

Use the command IP ADDRESS and enter the TCP/IP address assigned to this system. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Host Addresses

Use the command IP HOST and add Host addresses. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Gateway Address

Use the command IP GATEWAY and configure the Gateway address. Refer to "Commands" in the *User Instructions (Section 5847)* for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Netmask Address

Use the command IP NETMASK and configure the Netmask address. Refer to "Commands" in the *User Instructions (Section 5847)* for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Setting SNMP Parameters

Use the following commands to set the SNMP parameters.

GET Community String

Use the command SNMP GET and configure the Get community string. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

SET Community String

Use the command SNMP SET and configure the Set community string. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Setting Traps Parameters

Use the following commands to set the TRAPS parameters.

TRAP Community String

Use the command TRAPS COMMUNITY to configure the Traps community string. Refer to "Commands" in the User Instructions (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

TRAP Addresses

Use the command TRAPS ADD and add trap addresses. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

SNMP Version

Use the command TRAPS VERSION and configure the SNMP version for traps sent. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

TRAPS

Use the commands TRAPS OCCURRED, TRAPS RETIRED, and/or TRAPS PERSISTENT to set the SNMP Alarm Reporting method. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Occurred Alarm: Selects reporting of new system alarms that have occurred.

Retired Alarm: Selects reporting of system alarms that have cleared.

Persistent Alarm: Selects periodic reporting of system alarms that still exist.

The **Persistent Alarm Period** specifies how frequently the system will attempt a Persistent Alarm Report.

Setting Energy Management (if Energy Management Software Option Installed)

Note: *The LMS1000 Energy Management and Sequencing features are not for use in Spec. Nos. 582140000, 582140001, or 582126100 Power Systems.*

This procedure shows the user how to activate or disable the energy management option, if provided. This procedure also enters into the system the number of the analog channel connected to a plant input voltage source. The system monitors plant input voltage for efficient operation of energy management. Energy management channels must be configured as previously described. Refer also to the worksheets (or copies of) located at the end of the Installation section as a guide in programming the energy management option.

Guidelines: Energy management can be adversely affected by the following events or situations.

a. Any rectifier that does not extend an RFA alarm when turned off manually. The system uses the RFA alarm as an indicator of the rectifier's ability to deliver current to the load. A turned off rectifier without an RFA alarm indication results in the rectifier still being considered active (delivering current) when it is not.

b. Any alarm from any of the four possible setpoints for the analog input channel used for plant voltage monitoring

stops energy management and turns on all rectifiers/PCUs.

Note: *The alarm limits for A9001 are the settings of the VPS/NPS Power System's battery on discharge alarm, 50% battery on discharge alarm, high voltage alarm 1, and high voltage alarm 2.*

Note: *The alarm limits for A9901 are the settings of Spec. Nos. 582140000, 582140001, and 582126100 Power System's battery on discharge alarm, voltage is very low, high voltage alarm 1, and high voltage alarm 2.*

c. A failure of any associated analog circuit card or failure of the CPU circuit card stops energy management and turns on all rectifiers/PCUs.

d. Loss of communications to the VPS/NPS Power System stops Energy Management and turns on all controlled rectifiers/PCUs.

PROCEDURE:

The energy management feature, if provided, can be activated or disabled by using the command SET EFF which is described below. This command displays a header that contains the current configuration information. Then, individually, the command will list each item that can be changed, prompting for new or revised information to be entered. If the current information does not need to be changed, press ***ENTER*** to continue. This command is available to users programmed for access to level 6 commands. A user with access to level 5 commands is allowed to enable or disable the operation of the energy management feature using this command.

1. After logging onto the system, type ***SET EFF.*** Then press ***ENTER***.

   ```
   Command <6>: SET EFF
   ```

2. The system displays the default (or current) configuration of the energy management option, followed by...

   ```
   Plant Voltage Input= A
   ```

3. Type the number of the analog channel connected to a plant input voltage source, then press ***ENTER***. If the analog channel displayed is correct, press the ***ENTER*** key to end this command.

   Note: *If used with a VPS/NPS Power System, you may enter A9001 here.*

   Note: *If used with a Spec. No. 582140000, 582140001, or 582126100 Power System, you may enter A9901 here.*

4. The system responds with...

   ```
   Enter Base Rectifier Cycle Period (1-365
   days):
   ```

5. Type the number of days the base rectifier/PCU is to remain on before the next controlled rectifier/PCU (in a decremental rotation) becomes the base rectifier/PCU.

6. The system responds with...

   ```
   Percent of system capacity at which to
   turn off a rectifier (0.90-0.99):
   ```

   Note: *The value of percent capacity at which to TURN ON a rectifier/PCU must be GREATER THAN or EQUAL TO the value of percent capacity at which to TURN OFF a rectifier/PCU.*

7. Type a decimal number from .9 to .99 which represents the percent of total capacity of the would be operating rectifiers/PCUs. When load decreases to this percent, a rectifier/PCU is turned off.

8. The system responds with...

   ```
   Percent of system capacity at which to
   turn on a rectifier (0.97-0.99):
   ```

9. Type a decimal number from .97 to .99 which represents the percent of total capacity of the operating rectifiers/PCUs. When load increases to this percent, an additional rectifier/PCU is turned on.

10. The system responds with...

    ```
    Save changes (Y or N):
    ```

11. Type ***Y*** if the above entered data is to be saved in the configuration and ***N*** if not, then press ***ENTER***.

12. The system responds with...

    ```
    RECTIFIER EFFICIENCY (Y or N):
    ```

    Note: *A user with access to level 5 commands can execute this part of the command only.*

13. Type ***Y*** if it is desired to have energy management active. Type ***N*** if it is desired to have energy management disabled. Then press ***ENTER***.

Setting Sequential Start (if Sequential Start Software Option Installed)

Note: *The LMS1000 Energy Management and Sequencing features are not for use in Spec. Nos. 582140000, 582140001, or 582126100 Power Systems.*

This procedure shows the user how to enable or disable the standby and/or AC sequence option, if provided. This procedure also enters into the system the numbers of the binary channels required for sequence operation. A time delay can also be entered which will delay rectifier/PCU sequential start to allow the standby

equipment to start. Also, the Sequencer Failsafe Timer and AC Restoration Qualification Timer features can be configured. Each rectifier/PCU controlled by the sequencer must be configured into an Energy Management Channel, even if the energy management software option is not installed. Refer also to the worksheets (or copies of) located at the end of the Installation section as a guide in programming the sequencing option.

Guidelines:

Note: Eighteen seconds are required for LMS1000 to detect the change in the AC source and shut down the rectifiers/PCUs. Standby AC should not be supplied to the power plant within eighteen seconds of a commercial outage, and commercial AC should not be supplied to the plant within eighteen seconds of removing standby AC.

a. All rectifiers/PCUs are turned off when the "AC Fail/Transfer" binary input changes state. The method of operation is to have the "AC Fail/Transfer" input change state first before the "Standby On/Proper Operate" input. This turns the rectifiers/PCUs off before the standby power is transferred to the loads and starts the fail-safe timer.

b. Once the AC failure qualification period (15 seconds) expires, the system determines if the AC Sequencer activates. The AC sequencer starts when AC power is restored. Rectifiers/PCUs will be sequenced on if the AC sequencer is enabled, otherwise, all rectifiers/PCUs will be turned on simultaneously. The recommended method is to enable the AC sequencer to sequence the rectifiers/PCUs. The system constantly monitors the status of AC power and will start the AC sequencing process when restoration of AC power is detected.

c. Once the Standby start delay expires, the system determines if the Standby sequencer activates. If the "Standby On/Proper Operate" input is in the proper state, the Standby sequencer starts. Standby rectifiers/PCUs (rectifiers/PCUs configured to be on when running on standby power) will be sequenced on if the Standby sequencer is enabled, otherwise all standby rectifiers/PCUs will be turned on simultaneously. The recommended method is to enable the Standby sequencer to sequence the rectifiers/PCUs.

d. All rectifiers/PCUs are turned on and sequencing disabled if the fail-safe timer expires before AC power is restored or the start of Standby sequencing. The fail-safe time should not be configured to be less than the Standby start delay.

e. Sequencing starts with the rectifier/PCU connected to energy management channel one, and proceeds in numerical order. The energy management base rectifier/PCU remains the same as it was prior to the sequencer operation.

f. Each rectifier/PCU controlled by the sequencer must be configured into an Energy Management Channel, even if the energy management software option is not installed.

g. The timing involved in the operation of the rectifier/PCU sequencing feature will be affected if the alarm delay attributes for the binary channels selected to control the sequencer are configured. Configuring the "On Delay" or "Off Delay" for the AC Fail / Transfer input or Standby On / Proper Operate input will postpone detection (signals may have already been detected by the transfer device) of an AC Failure or Proper Operate signal by the system rectifier/PCU sequencing software.

Configuration Restrictions:

a. If the sequencer option is installed, a binary channel number must be entered for "`Standby On/Proper Operate Input=`".

b. If an AC fail or transfer circuit is not used, or does not exist, the binary channel number entered for "`Standby On/Proper Operate Input=`" must also be entered for "`AC Fail/Transfer Input=`". "`Input Type (Fail or Transfer):`" must also be set for "`Fail`".

PROCEDURE:

The sequencing feature, if provided, can be activated or disabled by using the command SET SEQUENCE which is described below. This command displays a header that contains the current configuration information. Then, individually, the command lists each item that can be changed, prompting for new or revised information to be entered. If the current information does not need to be changed, press ***ENTER*** to continue. This command is available to users programmed for access to level 6 commands.

1. After logging onto the system, type ***SET SEQUENCE***. Then press ***ENTER***.

   ```
   Command <6>: SET SEQUENCE
   ```

2. The system displays the default (or current) configuration of the sequence option, followed by...

   ```
   AC Sequencer on (Y or N):
   ```

3. Type ***Y*** if it is desired to enable sequencing of all the rectifiers/PCUs when AC power is restored. Type ***N*** if rectifier sequencing is not desired. Then press ***ENTER***.

Note: *If "N" is entered, all rectifiers/PCUs will be turned on simultaneously after the transfer back to AC power.*

4. The system responds with...

   ```
   AC Fail/Transfer Input= current info
   AC Fail/Transfer Input=
   ```

5. Type the number of the binary channel connected to the AC fail/transfer signal, then press ***ENTER***. If the binary channel displayed is the correct number, press the ***ENTER*** key to proceed. This binary input monitors the status of the commercial AC line or the power transfer signal, and shuts down the rectifiers/PCUs when the AC fails, or when the transfer switch has been operated. The binary input alarm condition is determined when the binary channel is configured.

6. The system responds with...

   ```
   Input Type (Fail or Transfer):
   ```

7. The system recognizes both a momentary type signal from a transfer switch, and a status type signal from an AC Fail sense circuit. Type ***FAIL*** if the AC Fail/Transfer Input monitors a steady state signal, and ***TRANSFER*** if it monitors a momentary signal. Then press ***ENTER***.

8. The system responds with...

   ```
   Standby Sequencer on (Y or N):
   ```

9. Type ***Y*** if it is desired to enable sequencing of standby rectifiers/PCUs. Type ***N*** if sequencing of standby rectifiers/PCUs is not desired. Then press ***ENTER***.

   Note: *If "N" is entered, all standby rectifiers/PCUs will be turned on simultaneously when the transfer to standby power is complete.*

10. The system responds with...

    ```
    Standby On/Proper Operate Input= current info
    Standby On/Proper Operate Input=
    ```

11. Type the number of the binary channel connected to the standby on/proper operate signal, then press ***ENTER***. If the binary channel displayed is the correct number, press the ***ENTER*** key to proceed. This binary input activates the standby sequencer after a commercial AC failure occurs. The binary input alarm condition is determined when the binary channel is configured. This signal monitors the status of the standby power source, and indicates that the standby power source is delivering power to the load.

12. The system responds with...

    ```
    Standby Start Delay: current info
    Standby Start Delay:
    ```

13. Type the desired standby sequential start time delay (15-1200 seconds) which will occur after the standby on/proper operate circuit is activated, then press ***ENTER***. If the start delay time displayed is correct, press the ***ENTER*** key to proceed. The rectifiers/PCUs are not sequenced on until after this delay time is up.

    Note: *There is a processing time delay of up to 18 seconds from the time the AC fail signal is asserted to the time the sequencing routine shuts off the rectifiers/PCUs.*

14. The system responds with...

    ```
    Sequencer Failsafe time: current info
    Sequencer Failsafe time:
    ```

15. Type the desired value (60-9999 seconds, 0=disabled) for the Sequencer Failsafe Timer feature. Then press ***ENTER***. This feature aborts sequencer operation when an external monitoring device controlling sequencer operation fails. The Sequencer Failsafe Time value should be greater than the Standby Start Delay value, or set to zero (0) to disable the feature.

    The timer starts when the system detects an AC failure or loss of Standby On/Proper Operate signal. If the timer expires before a signal is received, indicating that the commercial AC is restored or load was transferred to the standby power source, the following occur: The sequencer is disabled, an entry is made in the event log, the sequencer variables are reset, and all rectifiers/PCUs are turned on. If a signal is received before the timer expires, the timer is deactivated and reset. When the sequencer is disabled, the Set Sequence command must be re-issued to re-enable sequencer operation.

    Note: *An alarm report indicating that sequencer has aborted can be generated by configuring the alarm type and the program line of an LED or relay channel as follows: Rxx=E1, Lxx=E1.*

16. If "Fail" was entered above in Step 10), the system responds with...

    ```
    AC Restoration Qualification time:
    current info
    AC Restoration Qualification time:
    ```

17. Type the desired value (0-9999 seconds, 0=disabled) for the AC Restoration Qualification Timer feature. Then press ***ENTER***. This feature is only available when the INPUT TYPE attribute of the sequencer is configured as a FAIL type, and not as a TRANSFER type. This feature allows the sequencer to turn all rectifiers/PCUs off and start the sequence re-start operation at a specific time interval from when commercial AC is restored.

The timer starts when a signal is received indicating that the commercial AC is restored. The standby sequencer (if configured) operates normally until the timer expires. When the timer expires, all rectifiers/PCUs are turned off and the AC sequencer starts. If AC fails before the timer expires, the timer is deactivated.

Note: *The AC Restoration Qualification Timer feature should be set to a few seconds less than the actual amount of time required for a proper transfer.*

18. The system responds with...

    `Save changes (Y or N):`

19. Type ***Y*** if the above entered data is to be saved in the configuration and ***N*** if not, then press ***ENTER***.

20. The system responds with...

    `RECTIFIER SEQUENCING ROUTINES (Y or N):`

21. Type ***Y*** to enable the sequencer routines. Type ***N*** to disable the sequencer routines. If enabled, sequencer operation (routines) is determined by the attributes configured below for the AC Sequencer and the Standby Sequencer. If disabled, all rectifiers/PCUs are turned on.

Setting TL1 (if TL1 Software Option Installed)

Setting the TL1 Port Parameters

This procedure shows the user how to set the configurable parameters of the TL1 port. When the command is entered, the system displays the current value for each configurable parameter, followed by prompts to enter new configuration values. Type a new value and press ***ENTER***, or press ***ENTER*** to keep the current value.

PROCEDURE:

1. After logging onto the system, type ***SET MODE***. Then press ***ENTER***.

   `Command <6>: SET MODE`

2. The system displays the current TL1 port parameters.

Note: ***TL1 Mode: Direct*** *is displayed if the 'TL1/X.25' Software Option is installed.*

TL1 Mode: Telnet *is displayed if the 'TL1 (over Ethernet)' Software Option is installed.*

3. **For the TL1/X.25 software option**, the system responds with...

   `Enter new TL1/X.25 port data rate:`

   Type ***300***, ***1200***, ***2400***, ***4800***, or ***9600*** which represents the data rate in bits/sec for the TL1/X.25 port. Then press ***ENTER***.

   For the TL1 over Ethernet software option, the system responds with...
   `Enter new TL1 port number:`
   Type ***2020*** then `press` ***ENTER***.

4. **For the TL1 over Ethernet software option**, the system responds with...

   `TCP Keepalive (Y or N):`

   Type **Y** if the system should test TL1 Telnet connection to remote system (recommended), and **N** if not. Then press ***ENTER***.

   NOTE, THE REMAINDER IS DISPLAYED FOR BOTH THE TL1/X.25 and TL1 (OVER ETHERNET) SOFTWARE OPTIONS.

5. The system responds with...

   `Session Timeout (0-1440, 0=disabled):`

6. Type a number from ***0*** to ***1440*** which represents the TL1 port session timeout value in minutes. One day = 1440 minutes. Then press ***ENTER***. The session timeout feature of the TL1 port operates independently from the system's user timeout feature. A session timeout is indicated by transmission of the TL1 CANCEL-SESSION message. A value of zero for the session timeout parameter disables the session timeout feature.

7. The system responds with...

   `Auto logon (Y or N):`

8. Type ***Y*** if the system is required to automatically establish a user session, and ***N*** if not. Then press ***ENTER***.

9. If "Y" was typed above, the system responds with...

   `Auto logon user:`

10. Type the number of the user who is automatically logged on by the system. The configuration of the entered user determines the access level of the user session. Then press ***ENTER***.

11. The system responds with...

    `AID Delimiter (Y or N):`

12. In the system, the TL1 Access Identifier (AID) parameter consists of a LMS1000 Access Identifier parameter and a LMS1000 Sub-Access Identifier parameter, as explained in "Setting Access Identifiers" found later this section. Type ***Y*** to enable the use of a hyphen (AID delimiter) between the system Access Identifier parameter and LMS1000 Sub-Access Identifier parameter in all responses to TL1 commands and reports containing a TL1 Access Identifier field. Type ***N*** to disable the use of the "AID delimiter".

13. The system responds with...

    ```
    Save changes (Y or N):
    ```

14. Type ***Y*** if the above entered data is to be saved in the TL1 port parameter configuration and ***N*** if not. Then press ***ENTER***.

15. The system responds with...

    ```
    Must issue a hardware reset for changes
    to take effect
    ```

Setting Access Identifiers (applies only to TL1 commands/messages)

This procedure shows the user how to program up to thirty-two (32) Access Identifiers.

The terms Access Identifier, LMS1000 Access Identifier, and LMS1000 Sub-Access Identifier are described as follows.

Access Identifier: In an NMA system, a unique access identifier (AID) is used to identify each entity contained within the system. The system must be configured to allow a single access identifier to be used to access and report on an NMA system entity which may consist of a multiple of sub-entities, each monitored by a variety of LMS1000 channels. This is accomplished by configuring LMS1000 access identifiers and LMS1000 sub-access identifiers as described next. A list of access identifiers and sub-access identifiers appears in TA-NWT-001360, Table 4-1.

The system can be set to use an "AID delimiter". When enabled, the system access identifier field and the system sub-access identifier field in all responses to TL1 commands and reports containing a TL1 access identifier field is separated by a hyphen. The use of an "AID delimiter" (a hyphen) can be enabled or disabled, as described in "Setting the TL1 Port Parameters" found earlier in this section.

LMS1000 Access Identifier: Thirty-two (32) LMS1000 access identifiers are available. The system access identifier is used to uniquely identify a system entity (such as a power plant). The system Access Identifiers are configured through the use of the system command SET AID.

LMS1000 Sub-Access Identifier: The system sub-access identifiers are used to uniquely identify each sub-entity of an entity (such as each rectifier, each battery string, etc. contained in the power plant).

The association between all LMS1000 channels monitoring an individual rectifier, an individual battery string, etc. is made by configuring each channel monitoring this individual sub-entity with a unique sub-access identifier name. This is done when the individual LMS1000 channels are configured.

Thus all LMS1000 channels monitoring rectifier one may be configured with the sub-access identifier name RECT1. All LMS1000 channels monitoring rectifier two may be configured with sub-access identifier RECT2. All LMS1000 channels monitoring battery string one may be configured with the sub-access identifier BATSTR1. All LMS1000 channels monitoring battery string two may be configured with sub-access identifier name BATSTR2. Etc.

Now, to associate the sub-entities (each rectifier, each battery string, etc.) to the entity (the power plant), you configure the system access identifier to include all LMS1000 channels monitoring this entity and any sub-entity contained within. This is done through the use of the system command SET AID.

PROCEDURE:

1. After logging onto the system, type ***SET AID.*** Then press ***ENTER***.

   ```
   Command <6>: SET AID
   ```

2. The system responds with...

   ```
   Which Access Identifier?
   ```

3. Type the number (1-32) of the access identifier to be configured, then press ***ENTER***.

4. The system then responds by displaying the default (or current) configuration of the access identifier, followed by:

   ```
   Name:
   ```

5. Type the name of this access identifier (20 characters maximum), then press ***ENTER***. This name represents the AID data parameter used in TL1 commands.

   Valid characters are limited to alphanumeric characters.

6. The system responds with...

   ```
   Type:
   ```

7. Type ***EQPT*** or ***ENV***, then press ***ENTER***. This entry represents the type modifier used with the AID data parameter in TL1 commands. Identifies the entity represented by this access identifier either as an Equipment type or an Environment type.

   EQPT, refers to equipment entities or entities that are part of the NMA system (ex. battery plants, rectifiers, etc.)
   ENV, refers to environment entities or entities that are external to the NMA system (ex. air conditioners, fans, etc.)

8. The system responds with...

```
Enter channel (e.g. A0012 or A0001-0006)
or D to display.
Add channel:
```

9. Type ***D*** to display a complete list of channels previously linked to the current access identifier. The channel number, previously configured channel name, and previously configured channel sub-access identifier are displayed.

   Type the number(s) of all additional channels to be linked to this access identifier, then press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channel numbers (e.g. A0001-0008, L0001-0008). To exit, press the ***ENTER*** key without specifying a channel.

10. The system responds with...

```
Enter channel (e.g. A0012 or A0001-0006)
or D to display.
Del channel:
```

11. Type ***D*** to display a complete list of channels previously linked to the current access identifier. The channel number, previously configured channel name, and previously configured channel sub-access identifier are displayed.

    Type the number(s) of the previously linked channels that are to be deleted from this access identifier, then press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channel numbers (e.g. A0001-0008, L0001-0008). To exit, press the ***ENTER*** key without specifying a channel.

12. Repeat Steps 1) through 11) for the remaining access identifiers.

Configuration Required to Allow Access Door to be Locked and Unlocked Manually via LMS1000 (if 586505000/586505500 List 80 installed)

Note: *The following allows you to manually lock and unlock the Access Door if the Access Door Controller should fail.*

If an LMS1000 output relay is connected to the Access Door's electronic strike, configure the appropriate relay channel.

Also configure the following Programmable Commands. Refer to the LMS1000 Operating Instructions (Section 5847) for a procedure.

LOCK

Command Name: LOCK

Command Access Level: 6

Command Line 1: SET RLY nn, nn = the channel number of the relay controlling the latch (e.g. '01' for R0001)

UNLOCK

Command Name: UNLOCK

Command Access Level: 6

Command Line 1: CLR RLY nn, nn = the channel number of the relay controlling the latch (e.g. '01' for R0001)

Configuring Battery Thermal Runaway Feature

Note: *This feature only works with legacy VPS plants and not with the Spec. Nos. 582140000, 582140001, and 582126100 NetSure™ Power Systems (NPS).*

The LMS1000 is capable of overriding system output voltage (controlled by the MCA) to avoid thermal runaway.

- This is accomplished by using an LMS1000 channel to monitor for a thermal runaway condition.

  Examples:

  Using a binary input connected to a thermal switch.

  Using a temperature analog input connected to a temperature probe.

  Using a function channel's program line calculation.

  Using an LED channel triggered from any of the above or a Battery Thermal Runaway Alarm Class (see 'other examples').

  Using a RELAY channel triggered from any of the above or a Battery Thermal Runaway Alarm Class (see 'other examples')

  These are only a few of many possible thermal runaway trigger definitions/latching conditions that can be defined.

- When the LMS1000 senses thermal runaway, it takes control of the system's output voltage by setting the Test/Eq setpoint to a "Battery Thermal Runaway Voltage Level" and then placing the system into the Test/Eq mode.

  Note: *If this occurs, "Remote Override" is displayed when you navigate to the Set Mode screen of the MCA's FUNCTION MENU.*

  Note: *If the LMS1000 Battery Thermal Runaway Voltage value is not valid, the LMS1000 responds to the user that an invalid set point has been entered and no change has been made.*

- You set the monitored battery thermal runaway condition and battery thermal runaway voltage using the command BATTERY THERMAL. Refer to the Commands section in the LMS1000 User Instructions (Section 5847).

Other Examples

You can also define an LED channel to give a local indication that a Battery Thermal Runaway condition has been detected and to also trigger the Battery Thermal Runaway Voltage level.

Examples:

L0008 = B0101, B0101 can be the input of a thermal switch.

L0008 = A0102.1, A0102.1 can be the 1st alarm point of a temperature probe from a temperature card.

L0008 = F0032.4, F0032.4 can be any calculation of a function channel configuration using the 4th alarm point.

L0008 = K8, K8 is a defined Battery Thermal Runaway Alarm Class.

Or you can define a relay channel to give a remote indication that a Battery Thermal Runaway condition has been detected and to also trigger the Battery Thermal Runaway Voltage level.

Examples:

R0001 = K8, K8 is a defined Battery Thermal Runaway Alarm Class.

Built-In Failsafe Precautions

If…	Then…
LMS1000 and MCA Communications is Lost	After approximately 60 seconds the MCA returns to the mode (Float or Test/EQ) previously in operation before LMS1000 control.
LMS1000 Resets	After approximately 60 seconds the MCA returns to the mode (Float or Test/EQ) previously in operation before LMS1000 control. The LMS1000 continues to process alarms and control of the system after re-initialization is complete.
MCA Fails	The LMS1000 reports an MCA communications failure. The PCUs continue to provide current to the load at the Battery Thermal Runaway Plant Voltage.

Configuring MCA "CAN I/0" Circuit Cards (if installed in a Spec. No. 582140000, 5821400001, or 582126100 Bay)

Use the following commands to set the MCA "CAN I/O" circuit card parameters. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of these commands.

Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

SET NPS CANIO

Use this command to…

- designate MCA CAN I/O circuit card analog input as "Auxiliary" or "Distribution",
- set the scale factor for MCA CAN I/O circuit card analog input and output,
- designate the alarm state for MCA CAN I/O circuit card binary inputs.

SET NPS MESSAGE CANIO_BD

Use this command to set MCA CAN I/O circuit card custom text messages (names).

Configuring Analog Channels for Use with the 130VDC Monitoring Wire Harness

Configure the respective Analog Channel(s) with the following attributes when using the 130VDC Monitoring Wire Harness. Refer to SAG586505000/SAG586505500 for a description of the 130VDC Monitoring Wire Harness.

Note: *Use the small signal input on the Analog Card for the 130VDC Monitoring Wire Harness connection.*

- Transducer Type = Shunt
- Shunt Type = 50mv
- Scale Factor = 170

LMS Dual MCA Interface Software Option

Refer to the LMS documentation (especially Section 5847) for description, configuration, and operation of the LMS Dual MCA Interface feature. Refer to Spec. Nos. 582140000, 582140001, and 582126100 Power System documentation for system interconnections information.

Checking the System Time

This procedure shows the user how to check the internal clock of the system before placing the system into service.

PROCEDURE:

1. After logging onto the system, type ***TIME.*** Then press ***ENTER.***

   ```
   Command <6>: TIME
   ```

2. Verify that the current day of the week, month, day, year, and time are displayed.
3. This completes the procedure.

Checking for Alarms

This procedure shows the user how to check to see if any alarms are activated in the system before placing the system into service.

PROCEDURE:

1. After logging onto the system, type ***ALARMS***, then press ***ENTER***.

   `Command <6>: ALARMS`

2. Verify that no alarms are activated (as displayed on the screen).
3. This completes the procedure.

Downloading the Configuration

When configuration of the system is complete, the user should download a copy of the configuration to a personal computer using the DOWNLOAD command. Refer to "Operating LMS1000" in the *User Instructions (Section 5847)* for additional information. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Log off of the system. This completes the initial programming of the system. The remainder of this section explains how to change the configurations of specific system features.

Subsequent Configuration

After initial programming, various features of the system initially programmed using the SET SYSTEM command can be re-programmed separately, as explained in the section.

Changing the Date, Time, Unit Name, Unit Number, System Identifier, Unit Header, Unit Pager Code, and Pager Delay

The date, time, unit name, unit number, system identifier, unit header, unit pager code, and pager delay of the system can be changed by using the commands SET DATE, SET TIME, and SET UNIT respectively. Each command is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. The commands, when entered, will list each item that can be changed, showing the current information, and then prompting for new or revised information to be entered. If the current information does not need to be changed, press ***ENTER*** to continue.

Commands SET DATE, SET TIME, and SET UNIT: The various information pertaining to the system that can be changed through these commands is described below. The commands SET DATE, SET TIME, and SET DAY are available to a user programmed for access to level 3 commands. The command SET UNIT is available to users programmed for access to level 6 commands.

SET DATE

`Command <3>: SET DATE`	Type ***SET DATE***, then press ***ENTER***.
`Date is current info.` `Use Format mm/dd/yy`	Type the current date in the format specified, then press ***ENTER***. The system will then display the new date.

SET TIME

`Command <3>: SET TIME`	Type ***SET TIME***, then press ***ENTER***.
`Time is current info.` `Use Format hh:mm:ss`	Type the current time in the format specified, then press ***ENTER***. The system will then display the new time.

SET UNIT

`Command <6>: SET UNIT`	Type ***SET UNIT***, then press ***ENTER***.
`Unit Name:`	Type the desired unit name (30 characters maximum), then press ***ENTER***.
`Unit #`	Type the desired unit number (4 digits maximum), then press ***ENTER***.
`System Identifier:` ***Note:*** *This parameter does not appear if the TL1 software option is not installed.*	This parameter applies only to TL1 commands/messages. Type the desired System Identifier (20 characters maximum), then press ***ENTER***. This data parameter is used to identify the destination of command messages and the source of response and autonomous messages in an NMA system. ***Note:*** *Only alphanumeric characters are accepted for this parameter.*
`Unit Header:`	Type the desired unit header (79 characters maximum), then press ***ENTER***. The unit header is displayed when a user logs onto the system.
`Unit Pager Code:`	If required, type the desired unit pager code (20 characters maximum), then press ***ENTER***. The Unit Pager Code is the phone number at which the system is located followed by any terminating character required. This is the number that will appear in the display window of the paging system beeper unit.
`Pager Delay:`	Type the desired pager delay (0-99), then press ***ENTER***. The pager delay is the time delay (in seconds) between the last digit dialed in a pager phone number and outputting the pager PIN number.

Adding and Configuring LMS1000 Expansion Nodes

This procedure shows the user how to add and configure Expansion Nodes. Use this procedure if the system contains 586505000/586505500 Expansion Cabinets, 582140000/582140001/582126100 Secondary Bays with LMS1000 I/O cards, and/or 586505000/586505500 Expansion Assemblies.

Note: *Refer to "Operating LMS1000" in the* User Instructions *(Section 5847) for a description of nodes. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

PROCEDURE:

1. After logging onto the system, type ***NODE ADD***. Then press ***ENTER***.

   ```
   Command <6>: NODE ADD
   ```

2. The system searches for and adds to the database all Expansion Nodes found on the network. The Nodes are arbitrarily assigned numbers prefixed with an "X". The "X" indicates the Node is currently not configured. Also displayed is the configuration of the Node as it was programmed at the factory.

   ```
   Searching for new nodes
   Node#  Name          Spec. Number     Ser.#
   Loc  Echelon Id #
   X01     ---          58212190001      12346
   L    1A2B3C4D5F6A
   X02     ---          58212190001      12346
   R    1A2B3C4D5F6B
   X03     ---          58212190002      12347
   L    1A2B3C4D5F6C
   X04     ---          58212190002      12347
   R    1A2B3C4D5F6D
   ```

3. The system then prompts to select a Node to configure. Type the number of the Node to configure (as listed). Press ***ENTER*** to proceed.

   ```
   Which node? : X01
   ```

4. Enter configuration information as it is displayed. Press ***ENTER*** to proceed.

   ```
   Node Number: ---
   Node Number: 01
   Node Name: ---
   Node Name: Main Distribution Bay 1
   Spec Number: 58212190001
   Spec Number:
   Serial Number: 12346
   Serial Number:
   Location Number: L
   Location Number:
   Module 1 List Number: --
   Module 1 List Number: AB
   Module 2 List Number: --
   Module 2 List Number: D
   Module 3 List Number: --
   Module 3 List Number: T
   Module 4 List Number: --
   ```

```
Module 4 List Number: BK
```

5. After all configuration parameters are presented, the system prompts to save the changes. Type ***Y*** and press ***ENTER*** to save the Node's configuration.

```
Save changes (Y or N): Y
Storing node configuration
```

6. The system prompts to add channels to the Node's configuration. Type ***Y*** then press ***ENTER***.

```
Edit Node Channels (Y or N): Y
```

7. Add from the available channels those that are active in the system.

   Note: *Type the number(s) of available channels to be added to the Node's configuration, then press* **ENTER**. *Channels can be specified by entering a single channel number (e.g. A1, B8), or by entering a range of channels (e.g. A1-8, B1-12). To continue, press* **ENTER** *without specifying a channel.*

```
Enter channel (e.g. A12 or A1-6) or D to
display.
Add Channel: A1
Add Channel: A7-11
Add Channel: B1-4
Add Channel:
```

8. The system prompts to delete channels that were previously added to the Node's configuration. To continue, press ***ENTER*** without specifying a channel.

```
Enter channel (e.g. A12 or A1-6) or D to
display.
Del Channel:
Del Channel:
```

9. The system prompts to configure another Node. Type ***Y*** then press ***ENTER*** if there are remaining Nodes that need to be configured. Otherwise type ***N*** then press ***ENTER***. Repeat the above steps until all Nodes are configured.

```
Configure another node? (Y or N):
```

10. If you exit the NODE ADD command without configuring all Nodes, use the NODE CONFIGURE command.

    Hint: *Use the NODE LIST [*node_number*] command or NODE LIST LONG command to view additional information on the Node to be configured.*

Changing the Analog Channel Configurations

The analog channel configurations can be changed by using the command CONFIG. The command CONFIG is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. The command, when entered, will display a header that contains the current configuration. Then, individually, the command will list each item that can be changed, showing the current information, and then prompting for new or revised information to be entered. If the current information does not need to be changed, press ***ENTER*** to continue.

Command CONFIG: If the command CONFIG is entered, the system will ask that you identify which channel you wish to modify. Another way of entering the command is to identify the desired channel in the command line by typing the channel number after the characters CONFIG (ex. CONFIG A0001). The various information pertaining to an analog channel that can be changed through this command is described below. This command is available to users programmed for access to level 6 commands.

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

Note: *Only "Channel Active", "Channel Name", "Sub-Access Identifier", "System Alarm Reporting", "Monitor Type", and "Monitor Value Format" are configurable for MCA Interface channels. The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

CONFIG A_

`Command <6>: CONFIG A1`	Type ***CONFIG A1***, then press ***ENTER***.
If this channel's configuration parameters are not stored in the nonvolatile database that contains channel configuration parameters, the following prompt appears. `Channel A0001 does not exist! Create Channel? (Y or N):`	Type ***Y*** to continue configuring this channel's parameters. Typing ***N*** terminates the command.
`Channel active (Y or N):` ***Note:*** *If "Y" is entered, the system will allow the default configuration information of the current analog channel to be changed as shown below.*	Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.
If "N" was entered above, the system responds with... `Set channel configuration to default values? (Y or N):`	If ***Y*** is entered and the user elects to save the changes when prompted, the channel's configuration will be removed from the nonvolatile database that contains channel configuration parameters. If ***N*** is entered, the channel's configuration will remain in the nonvolatile database that contains channel configuration parameters.
`Name:`	Type the desired name for this analog channel (30 characters maximum), then press ***ENTER***.
`Sub-access Identifier:`	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.
`System Alarm Report mode (Y or N):`	Type ***Y*** if the system is required to initiate an alarm report if an alarm limit is exceeded on this channel and ***N*** if not, then press ***ENTER***.

CONFIG A_

`Transducer Type (Shunt, Current, Voltage, Temp, or None):`	Type ***SHUNT***, ***CURRENT***, ***VOLTAGE***, ***TEMP***, or ***NONE*** to specify the type of signal connected to the input associated to this channel. Then press ***ENTER***.
If "Shunt" was entered above, the system responds with... `Shunt type (50mv or 100mv):`	Type ***50mv*** or ***100mv*** to specify the shunt size connected to the input associated to this channel. Then press ***ENTER***.
If "Current" was entered above, the system responds with... `4-20 mA signal (Y or N):`	Type ***Y*** if this analog channel monitors a remote measuring module with a 4-20 mA output. Type ***N*** if this analog channel monitors any other signal. Then press ***ENTER***. ***Note:*** *If **Y** is entered, the analog channel will give a FAIL reading if the monitored signal drops below 2 mA.*
If "Voltage" was entered above, the system responds with... `Enter the transducer full-scale output in Volts:`	Type the value (in volts) of the maximum voltage to be measured by this channel.
If "Shunt", "Current", "Voltage", or "None" was entered above as the "Transducer Type", the system responds with... `Scale Factor:`	Type the required scale factor (20,000 maximum), then press ***ENTER***.
`Monitor type:`	This parameter applies only to TL1 commands/messages. Type the name of the unit (10 characters maximum) that the above alarms are measured in (ex. VOLTDC, CURDC, etc.), then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Table 6-1.
`Set monitor value format to integer(I) or decimal(D):`	This parameter applies only to TL1 commands/messages. Type I if the monitored value (monval) is a decimal integer. Type D if the monitored value (monval) is an unrestricted decimal number. Then press ***ENTER***.
`Alarm Polarity (+, -)?:`	Type '+' for Positive(default) polarity. Type '-' for Negative polarity Then press **ENTER**. See *Operating LMS1000* in Section 5847 (User Instructions) for further description and examples.
`Alarm Limit Mode (N or B) ?`	Type 'N' for 'Normal' operation. Type 'G' for 'Global' command operation. Then press <ENTER>
`Limit 1 Enabled (Y or N):`	Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
`Limit 1 Value:`	Type the required value of the first alarm setting (5 characters, 20000 maximum), then press ***ENTER***.
`Limit 1 Type is High or Low (H or L):`	Type ***H*** if the first alarm setting is a high limit and ***L*** if the first alarm setting is a low limit, then press ***ENTER***.
`Limit 1 Name:`	Type the desired name of the first alarm setting (10 characters maximum), then press ***ENTER***.

CONFIG A_

Limit 1 Notification Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Limit 1 Service Effect Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required
Alarm Class Number:	Type the desired alarm class number associated with the first alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Condition Type:	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
Condition Description:	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Limit 2 Enabled (Y or N):	Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
Limit 2 Value:	Type the required value of the second alarm setting (5 characters, 20000 maximum), then press ***ENTER***.
Limit 2 Type is High or Low (H or L):	Type ***H*** if the second alarm setting is a high limit and ***L*** if the second alarm setting is a low limit, then press ***ENTER***.
Limit 2 Name:	Type the desired name of the second alarm setting (10 characters maximum), then press ***ENTER***.
Limit 2 Notification Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Limit 2 Service Effect Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required

CONFIG A_

Alarm Class Number:	Type the desired alarm class number associated with the second alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Condition Type:	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
Condition Description:	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Limit 3 Enabled (Y or N):	Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
Limit 3 Value:	Type the required value of the third alarm setting (5 characters, 20000 maximum), then press ***ENTER***.
Limit 3 Type is High or Low (H or L):	Type ***H*** if the third alarm setting is a high limit and ***L*** if the third alarm setting is a low limit, then press ***ENTER***.
Limit 3 Name:	Type the desired name of the third alarm setting (10 characters maximum), then press ***ENTER***.
Limit 3 Notification Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Limit 3 Service Effect Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required
Alarm Class Number:	Type the desired alarm class number associated with the third alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Condition Type:	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

CONFIG A_

Condition Description:	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Limit 4 Enabled (Y or N):	Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
Limit 4 Value:	Type the required value of the fourth alarm setting (5 characters, 20000 maximum), then press ***ENTER***.
Limit 4 Type is High or Low (H or L):	Type ***H*** if the fourth alarm setting is a high limit and ***L*** if the fourth alarm setting is a low limit, then press ***ENTER***.
Limit 4 Name:	Type the desired name of the fourth alarm setting (10 characters maximum), then press ***ENTER***.
Limit 4 Notification Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Limit 4 Service Effect Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required
Alarm Class Number:	Type the desired alarm class number associated with the fourth alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Condition Type:	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
Condition Description:	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Unit Text:	Type the name of the unit (4 characters maximum) that the above alarms are measured in (ex. volt, amp, etc.), then press ***ENTER***.

CONFIG A_

`Off Delay Time:`	Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.
`On Delay Time:`	Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.
`Save changes (Y or N):`	Type ***Y*** if the above entered data is to be saved in the current analog configuration file and ***N*** if not, then press ***ENTER***.

Changing the Binary Channel Configurations

The binary channel configurations can be changed by using the commands CONFIG. The command CONFIG is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. The command, when entered, will display a header that contains the current configuration. Then, individually, the command will list each item that can be changed, showing the current information, and then prompting for new or revised information to be entered. If the current information does not need to be changed, press **ENTER** to continue.

Command CONFIG: If the command CONFIG is entered, the system will ask that you identify which channel you wish to modify. Another way of entering the command is to identify the desired channel in the command line by typing the channel number after the characters CONFIG (ex. CONFIG B1). The various information pertaining to a binary channel that can be changed through this command is described below. This command is available to users programmed for access to level 6 commands.

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

Note: *The "Alarm Condition" attribute of the MCA Interface channels is not configurable. The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.*

CONFIG B_

`Command <6>: CONFIG B1`	Type ***CONFIG B1***, then press ***ENTER***.
If this channel's configuration parameters are not stored in the nonvolatile database that contains channel configuration parameters, the following prompt appears. `Channel B0001 does not exist! Create Channel? (Y or N):`	Type ***Y*** to continue configuring this channel's parameters. Typing ***N*** terminates the command.
`Channel active (Y or N):` ***Note:*** *If "Y" is entered, the system will allow the default configuration information of the current binary channel to be changed as shown below.*	Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.
If "N" was entered above, the system responds with... `Set channel configuration to default values? (Y or N):`	If ***Y*** is entered and the user elects to save the changes when prompted, the channel's configuration will be removed from the nonvolatile database that contains channel configuration parameters. If ***N*** is entered, the channel's configuration will remain in the nonvolatile database that contains channel configuration parameters.
`Name:`	Type the desired name for this binary channel (30 alpha-numeric characters maximum), then press ***ENTER***.
`Sub-access Identifier:`	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.
`System Alarm Report mode (Y or N):`	Type ***Y*** if the system is required to initiate an alarm report via phone lines if the alarm condition occurs on this channel and ***N*** if not, then press ***ENTER***.

CONFIG B_

Condition Type:	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
Condition Description:	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Notification Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Service Effect Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required
Alarm Condition (CC or CO):	Type the characters ***CC*** or ***CO*** which represents the condition required to activate an alarm, then press ***ENTER***.
Alarm Class Number:	Type the desired alarm class number associated with this channel, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Off Delay Time:	Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds. ***Note:*** *The timing involved in the operation of the rectifier sequencing feature will be affected if the alarm delay attributes for the binary channels selected to control the sequencer are configured. Configuring the "On Delay" or "Off Delay" for the AC Fail / Transfer input or Standby On / Proper Operate input will postpone detection (signals may have already been detected by the transfer device) of an AC Failure or Proper Operate signal by the rectifier sequencing software.*

CONFIG B_

`On Delay Time:`	Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds. ***Note:*** *The timing involved in the operation of the rectifier sequencing feature will be affected if the alarm delay attributes for the binary channels selected to control the sequencer are configured. Configuring the "On Delay" or "Off Delay" for the AC Fail / Transfer input or Standby On / Proper Operate input will postpone detection (signals may have already been detected by the transfer device) of an AC Failure or Proper Operate signal by the rectifier sequencing software.*
`Save changes (Y or N):`	Type ***Y*** if the above entered data is to be saved in the current binary configuration file and ***N*** if not, then press ***ENTER***.

Changing the Energy Management Channel Configurations

The energy management channel configurations can be changed by using the command CONFIG. The command CONFIG is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. The command, when entered, will display a header that contains the current configuration. Then, individually, the command will list each item that can be changed, showing the current information, and then prompting for new or revised information to be entered.

WARNING! Any rectifier that does not extend an RFA alarm when the rectifier is manually turned off will still be included in energy management calculations as an active rectifier. Therefore, if such a rectifier is manually turned off, it is important to also turn off or reprogram the energy management feature.

Command CONFIG: If the command CONFIG is entered, the system will ask that you identify which channel you wish to modify. Another way of entering the command is to identify the desired channel in the command line by typing the channel number after the characters CONFIG (ex. CONFIG E1). The various information pertaining to an energy management channel that can be changed is described below. This command is available to users programmed for access to level 6 commands.

CONFIG E_

`Command <6>: CONFIG E1`	Type ***CONFIG E1***, then press ***ENTER***.
`Channel active (Y or N):` ***Note:*** *If "Y" is entered, the system will allow the default configuration information of the current energy management channel to be changed as shown below.*	Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.
`Name:`	Type the desired name for this energy management channel (30 characters maximum), then press ***ENTER***.
`(name entered above) Shunt =`	Type the number of the analog channel connected to the input shunt of the rectifier connected to this channel, then press ***ENTER***. or Type the name of the analog channel automatically mapped to monitor this PCUs output current, then press ***ENTER***. Refer to the Operation section of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.
Note: *If the analog channel selected in the "Shunt=" step is not associated to a PCU shunt, the system responds with...* `(name entered above) Capacity:`	Type the rated full load input capacity (in amperes) of the rectifier connected to this channel (5 characters maximum), then press ***ENTER***. ***Note:*** *This parameter is not user configurable for PCUs, this value is automatically obtained by the software.*
Note: *If the analog channel selected in the "Shunt=" step is not associated to a PCU shunt, the system responds with...* `(name entered above) RFA =`	Type the number of the binary channel connected to the RFA alarm circuit of the rectifier connected to this channel, then press ***ENTER***. ***Note:*** *This parameter is not user configurable for PCUs, this value is automatically obtained by the software.* ***Note:*** *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port, option Energy Management RFA's are summed together and total number of rectifiers failures is passed to the MCA and used in determining 'Rectifier Minor' and 'Rectifier Major' alarms. This only applies to Energy Management channels not associated to Vortex/NETSURE PCU's.*

CONFIG E_

Note: *If the analog channel selected in the "Shunt=" step is not associated to a PCU shunt, the system responds with...* `(name entered above) TR lead =`	Type the number of the relay channel connected to the TR or RCC leads of the rectifier connected to this channel, then press ***ENTER***. ***Note:*** *Only use relay channel on circuit cards installed in the 586505000/586505500 Main Cabinet or 582140000/582140001/582126100 Primary Power Bay. DO NOT use relay circuit cards in Expansion Cabinets for controlling rectifiers.* ***Note:*** *This parameter is not user configurable for PCUs.*
`Rectifier On when Standby ON (Y or N):`	Type ***Y*** if it is required to have the rectifier/PCU connected to this channel to be turned on if a standby source is supplying power to the rectifier/PCU and ***N*** if not, then press ***ENTER***.
`Save changes (Y or N):`	Type ***Y*** if the above entered data is to be saved in the current energy management configuration file and ***N*** if not, then press ***ENTER***.

Changing the Function Channel Configurations

The function channel configurations can be changed by using the command CONFIG. The command CONFIG is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. The command, when entered, will display a header that contains the current configuration. Then, individually, the command will list each item that can be changed, showing the current information, and then prompting for new or revised information to be entered. If the current information does not need to be changed, press **ENTER** to continue.

Command CONFIG: If the command CONFIG is entered, the system will ask that you identify which channel you wish to modify. Another way of entering the command is to identify the desired channel in the command line by typing the channel number after the characters CONFIG (ex. CONFIG F1). The various information pertaining to a function channel that can be changed through this command is described below. This command is available to users programmed for access to level 6 commands.

Note: *In a 582140000, 582140001, and 582126100 Power System, function channel 64 is dedicated for summing the total current output of conventional rectifiers in a hybrid application. The channel name for F64 defaults to "Total Rectifier Output." The LMS updates the MCA with the calculated value for the configured program line.*

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

CONFIG F_

`Command <6>: CONFIG F1`	Type ***CONFIG F1***, then press ***ENTER***.
`Channel active (Y or N):` ***Note:*** *If "Y" is entered, the system will allow the default configuration information of the current function channel to be changed as shown below.*	Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.
If "N" was entered above, the system responds with... `Set channel configuration to default values? (Y or N):`	Type ***Y*** to change the attributes of this channel to their default values. ***Note:*** *If "Y" is entered, this command terminates.* *If "N" is entered, the system will allow the default configuration information of the current function channel to be changed as shown below.*
`Name:`	Type the desired name for this function channel (30 characters maximum), then press ***ENTER***.
`Sub-access Identifier:`	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.
`System Alarm Report mode (Y or N):`	Type ***Y*** if the system is required to initiate an alarm report via phone lines if an alarm limit is exceeded on this channel and ***N*** if not, then press ***ENTER***.
`Monitor type:`	This parameter applies only to TL1 commands/messages. Type the name of the unit (10 characters maximum) that the above alarms are measured in (ex. VOLTDC, CURDC, etc.), then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Table 6-1.

CONFIG F_

`Set monitor value format to integer(I) or decimal(D):`	This parameter applies only to TL1 commands/messages. Type I if the monitored value (monval) is a decimal integer. Type D if the monitored value (monval) is an unrestricted decimal number. Then press ***ENTER***.
`Limit 1 Enabled (Y or N):`	Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
`Limit 1 Value:`	Type the required value of the first alarm setting (5 characters, 99999 maximum), then press ***ENTER***.
`Limit 1 Type is High or Low (H or L):`	Type ***H*** if the first alarm setting is a high limit and ***L*** if the first alarm setting is a low limit, then press ***ENTER***.
`Limit 1 Name:`	Type the desired name of the first alarm setting (10 characters maximum), then press ***ENTER***.
`Limit 1 Notification Code:`	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
`Limit 1 Service Effect Code:`	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required
`Alarm Class Number:`	Type the desired alarm class number associated with the first alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
`Condition Type:`	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
`Condition Description:`	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
`Limit 2 Enabled (Y or N):`	Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
`Limit 2 Value:`	Type the required value of the second alarm setting (5 characters, 99999 maximum), then press ***ENTER***.
`Limit 2 Type is High or Low (H or L):`	Type ***H*** if the second alarm setting is a high limit and ***L*** if the second alarm setting is a low limit, then press ***ENTER***.
`Limit 2 Name:`	Type the desired name of the second alarm setting (10 characters maximum), then press ***ENTER***.

CONFIG F_

Limit 2 Notification Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Limit 2 Service Effect Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required
Alarm Class Number:	Type the desired alarm class number associated with the second alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Condition Type:	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
Condition Description:	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Limit 3 Enabled (Y or N):	Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
Limit 3 Value:	Type the required value of the third alarm setting (5 characters, 99999 maximum), then press ***ENTER***.
Limit 3 Type is High or Low (H or L):	Type ***H*** if the third alarm setting is a high limit and ***L*** if the third alarm setting is a low limit, then press ***ENTER***.
Limit 3 Name:	Type the desired name of the third alarm setting (10 characters maximum), then press ***ENTER***.
Limit 3 Notification Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Limit 3 Service Effect Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required

CONFIG F_

Alarm Class Number:	Type the desired alarm class number associated with the third alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Condition Type:	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
Condition Description:	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Limit 4 Enabled (Y or N):	Type ***Y*** to enable this alarm limit or ***N*** to disable this alarm limit. Then press ***ENTER***.
Limit 4 Value:	Type the required value of the fourth alarm setting (5 characters, 99999 maximum), then press ***ENTER***.
Limit 4 Type is High or Low (H or L):	Type ***H*** if the fourth alarm setting is a high limit and ***L*** if the fourth alarm setting is a low limit, then press ***ENTER***.
Limit 4 Name:	Type the desired name of the fourth alarm setting (10 characters maximum), then press ***ENTER***.
Limit 4 Notification Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Limit 4 Service Effect Code:	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action require
Alarm Class Number:	Type the desired alarm class number associated with the fourth alarm limit, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Condition Type:	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.

CONFIG F_

`Condition Description:`	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
`Unit Text:`	Type the name of the unit (4 characters maximum) that the above alarms are measured in (ex. volt, amp, etc.), then press ***ENTER***.
`Off Delay Time:`	Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.
`On Delay Time:`	Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.
`Save changes (Y or N):`	Type ***Y*** if the above entered data is to be saved in the current function configuration file and ***N*** if not, then press ***ENTER***.
Note: *If "Y" was entered above, the system then responds with...* `Enter Program Line:`	Type the program line (79 characters maximum) which determines the input value of this channel, then press ***ENTER***. Refer to the beginning of this section for a discussion on program lines. ***Note:*** *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port option, channels F64 and F63 are used to provide the values to the Power System MCA for 'Total Rectifier Output' and 'External Distribution Load' status readings respectively. Any value assigned/calculated in the program lines of these channels will be passed to the MCA and summed into the 'Total Charger Output' and 'Total Load Current' respectively (as viewed on LMS1000 channels A9902 and A9904).*

Changing the LED Channel Configurations

The LED channel configurations can be changed by using the commands CONFIG. The command CONFIG is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. The command, when entered, will display a header that contains the current configuration. Then, individually, the command will list each item that can be changed, showing the current information, and then prompting for new or revised information to be entered. If the current information does not need to be changed, press **ENTER** to continue.

Command CONFIG: If the command CONFIG is entered, the system will ask that you identify which channel you wish to modify. Another way of entering the command is to identify the desired channel in the command line by typing the channel number after the characters CONFIG (ex. CONFIG L1). The various information pertaining to an LED Channel that can be changed through this command is described below. This command is available to users programmed for access to level 6 commands.

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

CONFIG L_

`Command <6>: CONFIG L1`	Type ***CONFIG L1***, then press ***ENTER***.
`Channel active (Y or N)` ***Note:*** *If "Y" is entered, the system will allow the default configuration information of the current LED channel to be changed as shown below.*	Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.
If "N" was entered above, the system responds with... `Set channel configuration to default values? (Y or N):`	Type ***Y*** to change the attributes of this channel to their default values. ***Note:*** *If "Y" is entered, this command terminates.* *If "N" is entered, the system will allow the default configuration information of the current LED channel to be changed as shown below.*
`Name:`	Type the desired name for this LED channel (30 characters maximum), then press ***ENTER***.
`Color (Red, Green, or Amber):`	Type ***Red***, ***Green***, or ***Amber*** to specify the color the LED illuminates, then press ***ENTER***.
`Sub-access Identifier:`	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.
`Alarm Type (Y or N):`	Type ***Y*** if the alarm condition determined by this channel is required to be recorded in the alarm log (required if System Alarm Reporting is desired for this channel, and/or an alarm class of 1 through 8 is assigned to this channel) when it is activated and ***N*** if not, then press ***ENTER***.
Note: *If "Y" was entered above, the system responds with...* `System Alarm Report mode (Y or N):`	Type ***Y*** if the system is required to initiate an alarm report via phone lines if this channel alarms and ***N*** if not, then press ***ENTER***.
Note: *If "Y" was entered above for "Alarm Type", the system responds with...* `Alarm Class Number:`	Type the desired alarm class number associated with this channel, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.

CONFIG L_

Note: *This parameter is configurable only if the channel is configured as an Alarm Type.* `Condition Type:`	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
Note: *This parameter is configurable only if the channel is configured as an Alarm Type.* `Condition Description:`	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Note: *This parameter is configurable only if the channel is configured as an Alarm Type.* `Notification Code:`	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Note: *This parameter is configurable only if the channel is configured as an Alarm Type.* `Service Effect Code:`	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required
`Control Type:`	This parameter applies only to TL1 commands/messages. Type the name of the NMA system external control entity (10 characters maximum) that this channel is controlling, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to Appendix G of TR-NWT-000833, issue 5.
`Off Delay Time:`	Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.
`On Delay Time:`	Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.
`Save changes (Y or N):`	Type ***Y*** if the above entered data is to be saved in the current LED configuration file and ***N*** if not, then press ***ENTER***.

CONFIG L_

Note: *If "Y" was entered above, the system responds with...* `Enter Program Line:`	Type the program line (79 characters maximum) which determines when the LED illuminates, then press ***ENTER***. Refer to the beginning of this section for a discussion on program lines. ***Note:*** *When the LMS1000 is used in a 582140000, 582140001, and 582126100 NETSURE Power System that communicates to the LMS1000 using the LISP port option, channel L7 is dedicated to provide an 'External Fuse Alarm' indication and channel L8 is dedicated to provide an 'External AC Fail Alarm' indication to the Power System MCA. Any state generated by the program lines of these channels will be passed to the MCA as an 'External Fuse Alarm' and an 'External AC Fail Alarm' indication respectively.*

Changing the Relay Channel Configurations

The relay configurations can be changed by using the commands CONFIG. The command CONFIG is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. The command, when entered, will display a header that contains the current configuration. Then, individually, the command will list each item that can be changed, showing the current information, and then prompting for new or revised information to be entered. If the current information does not need to be changed, press **ENTER** to continue.

Command CONFIG: If the command CONFIG is entered, the system will ask that you identify which channel you wish to modify. Another way of entering the command is to identify the desired channel in the command line by typing the channel number after the characters CONFIG (ex. CONFIG R1). The various information pertaining to a relay channel that can be changed through this command is described below. This command is available to users programmed for access to level 6 commands.

Note: *Relay channels associated with an energy management channel cannot be programmed.*

Note: *Parameters which apply only to TL1 commands/messages do not appear for configuration if the TL1 software option is not installed.*

CONFIG R_

`Command <6>: CONFIG R1`	Type ***CONFIG R1***, then press ***ENTER***.
If this channel's configuration parameters are not stored in the nonvolatile database that contains channel configuration parameters, the following prompt appears. `Channel R0001 does not exist! Create Channel? (Y or N):`	Type ***Y*** to continue configuring this channel's parameters. Typing ***N*** terminates the command.
`Channel active (Y or N):` ***Note:*** *If "Y" is entered, the system will allow the default configuration information of the current relay channel to be changed as shown below.*	Type ***Y*** if the channel is required to be active and ***N*** if not, then press ***ENTER***.
If "N" was entered above, the system responds with... `Set channel configuration to default values? (Y or N):`	If ***Y*** is entered and the user elects to save the changes when prompted, the channel's configuration will be removed from the nonvolatile database that contains channel configuration parameters. If ***N*** is entered, the channel's configuration will remain in the nonvolatile database that contains channel configuration parameters.
`Name:`	Type the desired name for this relay channel (30 characters maximum), then press ***ENTER***.
`Sub-access Identifier:`	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) of the sub-access identifier that this channel belongs to, then press ***ENTER***. The group of LMS1000 channels monitoring a sub-entity in an NMA system should have the same access identifier and sub-access identifier. Only alpha-numeric characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360, Table 4-1.
`Alarm Type (Y or N):`	Type ***Y*** if the alarm condition determined by this channel is required to be recorded in the alarm log (required if System Alarm Reporting is desired for this channel, and/or an alarm class of 1 through 8 is assigned to this channel) when it is activated and ***N*** if not, then press ***ENTER***.

CONFIG R_

Note: *If "Y" was entered above, the system responds with...* `System Alarm Report mode (Y or N):`	Type ***Y*** if the system is required to initiate an alarm report via phone lines if this channel alarms and ***N*** if not, then press ***ENTER***.
Note: *If "Y" was entered above for "Alarm Type", the system responds with...* `Alarm Class Number:`	Type the desired alarm class number associated with this channel, then press ***ENTER***. Alarm classes are specified with the numbers 0 through 8, with 0 representing no alarm class.
Note: *This parameter is configurable only if the channel is configured as an Alarm Type.* `Condition Type:`	This parameter applies only to TL1 commands/messages. Type the name (20 characters maximum) which describes this alarm or event state, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to TA-NWT-001360 Tables 5-1 through 5-4.
Note: *This parameter is configurable only if the channel is configured as an Alarm Type.* `Condition Description:`	This parameter applies only to TL1 commands/messages. Type a user-defined text message (40 characters maximum) which provides a detailed description of this alarm, event, or condition. Then press ***ENTER***. May also be used to describe any action to be taken as a result of the condition. All printable ASCII characters are valid except for the percent sign (%), double quotes ("), and the backslash (\).
Note: *This parameter is configurable only if the channel is configured as an Alarm Type.* `Notification Code:`	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes the severity of this alarm or event condition, then press ***ENTER***. CR - critical alarm MJ - major alarm MN - minor alarm NA - not alarmed NR - not reported when event occurs
Note: *This parameter is configurable only if the channel is configured as an Alarm Type.* `Service Effect Code:`	This parameter applies only to TL1 commands/messages. Type one of the following codes which describes how this alarm or event affects service, then press ***ENTER***. SA=service-affecting condition, immediate action required NSA=nonservice-affecting condition, action required
`Affected by ACO (Y or N):`	Type the characters ***Y*** or ***N*** which represent if the alarm can be cut off, then press ***ENTER***. Y=yes, ACO enabled, N=NO, ACO disabled
`Cycle Freq (min):`	Type the required cycle frequency of the relay channel (0-1440 minutes), then press ***ENTER***. When a relay is energized, the system can be programmed to de-energize the relay at a selected time interval. This time interval is determined by the relay's "cycle frequency". This feature resets external alarm logic that requires an open to close transition for alarming. During a relay alarm condition, the relay remains energized for the time duration determined by the value of the relay's cycle frequency. Once this time period expires, the system de-energizes the relay for 15 seconds. The system will then re-energize the relay if the alarm condition still exists. If the relay channel is set to be affected by ACO, the cycle frequency is also used to automatically release the alarm cut-off feature at a selected time interval determined by the cycle frequency. The system automatically performs the equivalent of a CLR ACO command at the end of the "cycle frequency". To disable these features, set the "cycle frequency" to zero.

CONFIG R_

`Control Type:`	This parameter applies only to TL1 commands/messages. Type the name of the NMA system external control entity (10 characters maximum) that this channel is controlling, then press ***ENTER***. Only alpha characters can be entered for this parameter. TL1 uses specific values for this parameter. Refer to Appendix G of TR-NWT-000833, issue 5.
`Off Delay Time:`	Type the required alarm off delay time period* and a modifier*, then press ***ENTER***. The off delay time is the amount of seconds that an alarm condition must cease before the system recognizes that the alarm condition ceased. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.
`On Delay Time:`	Type the required alarm on delay time period* and a modifier*, then press ***ENTER***. The on delay time is the amount of seconds that an alarm condition must exist before the system recognizes it as an alarm condition. * Enter a valid value (0-9999) then the modifier (s for seconds, m for minutes, h for hours). If no modifier entered, modifier defaults to seconds.
`Save changes (Y or N):`	Type ***Y*** if the above entered data is to be saved in the relay configuration and ***N*** if not, then press ***ENTER***.
Note: *If "Y" was entered above, the system responds with...* `Enter Program Line:`	Type the program line (79 characters maximum) which determines when the relay energizes, then press ***ENTER***. Refer to the beginning of this section for a discussion on program lines.

Changing the Number of Rings before Answer

Use the command SET ANSWER. Refer to "Commands" in the *User Instructions* (Section 5847) for further information on the use of this command. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Changing the User Configurations

The user configurations can be changed by using the command SET USERS. The command is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. The command, when entered, will display a header that contains the current configuration information. Then, individually, the commands will list each item that can be changed, showing the current information, and then prompting for new or revised information to be entered. If the current information does not need to be changed, press ***ENTER*** to continue.

Command SET USERS: The various information pertaining to a user that can be changed through this command is described below. This command is available to users programmed for access to level 6 commands.

Note: *The Operation section in the User Instructions (Section 5847) lists the MCA Interface channels. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. Add these channels to the user group as necessary.*

SET USERS

`Command <6>: SET USERS`	Type ***SET USERS***, then press ***ENTER***.
`Which User (1 - 8):`	Type the number which corresponds to the user configuration which is to be revised, then press ***ENTER***.
`User active (Y or N):` ***Note:*** *This prompt is not displayed if the logged on user is modifying his own user configuration. A user cannot de-activate his own configuration.*	Type ***Y*** if the user is required to be active and ***N*** if not, then press ***ENTER***. ***Note:*** *If "N" is entered, this command terminates. If "Y" is entered, the system allows the default configuration information of the user to be changed as shown below.*
`Name:`	Type the desired name for this user (30 characters maximum unless used with TL1, then 10 characters maximum), then press ***ENTER***. The system uses this name to identify various activities of the user such as when he accesses the system or changes a configuration of the system.
`Password:`	Type the desired password for the user (8 characters maximum), then press ***ENTER***. Each user is programmed with a unique password that grants him access to a specific command level. There is no provision for changing access levels once a person is logged on to the system. Additionally, a user can not change his own password unless he is programmed for access to level 6 commands. ***Note:*** *If the user is to access LMS1000 through the TL1 port, the user's password must contain two non-alpha characters. One of these must be a symbol. ([%], [#], and [+] are the only valid symbols.)*
`Access Level (1-6):` ***Note:*** *This prompt is not displayed if the logged on user is modifying his own user configuration. A user cannot change his own access level.*	Type the desired access level (1-6) of the user, then press ***ENTER***. The access level determines which commands are available to a particular user. Level 6 allows the user to have access to all the commands.
`Callback (Y or N):`	Type ***Y*** if the user requires the callback feature and ***N*** if not, then press ***ENTER***. The callback feature allows additional system security when accessing the system via its modem. After a user calls the system and enters his password, the system will hang-up and call the user back at the preprogrammed designated phone number.

SET USERS

`Primary Phone:`	Type the primary phone number of the user that the system will use for callbacks, System Alarm Reports, and User Reports (20 characters maximum), then press ***ENTER***. ***Note:*** *If the alarm report is to be initiated through a pager, set the user phone number to that of the paging system. If the remote paging system requires a Personal Identification Number (PIN) to gain access, then the PIN must be entered as part of the user phone number. This is done by entering the pager system phone number followed by the character 'B' followed by the PIN and any terminating character required (for example, '#').*
`Valid Times for Primary Phone`	The primary phone number or primary Email will be used by the system only during valid days and hours, as programmed below.
`From Day:`	Type the beginning day of the week the user wants to be contacted at the primary phone number for callbacks and primary phone number or primary Email for System Alarm Reports and User Reports (1-7, Sunday=1), then press ***ENTER***.
`Thru Day:`	Type the ending day of the week the user wants to be contacted at the primary phone number for callbacks and primary phone number or primary Email for System Alarm Reports and User Reports (1-7, Sunday=1), then press ***ENTER***.
`From Hour:`	Type the beginning hour of the day the user wants to be contacted at the primary phone number for callbacks and primary phone number or primary Email for System Alarm Reports and User Reports (00-23), then press ***ENTER***.
`Thru Hour:`	Type the ending hour of the day the user wants to be contacted at the primary phone number for callbacks and primary phone number or primary Email for System Alarm Reports and User Reports (00-23), then press ***ENTER***. *Example:* *If 16 is entered, the primary phone # or primary Email is used through 16:59.*
`Alternate Phone:`	Type an alternate phone number the system will use for callbacks, System Alarm Reports, and User Reports when the current date or time is not valid as programmed above (20 characters maximum), then press ***ENTER***. ***Note:*** *If System Alarm Reports and User Reports are to be initiated through a pager, do not enter an alternate phone number.*
`Primary E-mail:`	Type the Email address the system is to use for System Alarm Reports and User Reports during the "Valid Days & Hours for Primary Phone Number", then press ***ENTER***.
`Alternate E-mail:`	Type the Email address the system is to use for System Alarm Reports and User Reports outside of the "Valid Days & Hours for Primary Phone Number", then press ***ENTER***.

SET USERS

`Report Device (Modem, Ethernet, X25 [only if TL1/X.25 option installed], or Telnet [only if TL1 over Telnet option installed]):`	Type the desired report device (select Modem, Ethernet, X25, or Telnet) that the system uses to issue System Alarm Reports and User Reports, then press ***ENTER***. ***Note:*** *"Modem" = LMS1000 Modem* *"Ethernet" = Email notification via Ethernet Port* *"X25" = TL1/X.25 Port* *"Telnet" = TL1 over Ethernet Port*

`Report Mode (Off, Pager, M300, M1200, M2400,M9600, M28800, M33600, or M56000):`
`or`
`Report Mode (Off or E-mail):`
`or`
`Report Mode (Off or TL1):`
	If "Modem" was typed above as the Report Device, type the desired mode (select off, pager, or M[bits/s] that the system uses to send System Alarm Reports and User Reports, then press ***ENTER***.
	Note: *If the report mode is set to pager, enter the required information for the primary phone number (See Primary Phone above), unit pager code (See Set Unit Command), and pager delay (See Set Unit Command).*
	If "Ethernet" was typed above as the Report Device, type ***Off*** or ***E-mail***, then press ***ENTER***. OFF = alarm reports are not processed. E-mail = System Alarm Reports and User Reports sent via Email.
	If "X25" or "Telnet" was typed above as the Report Device, type ***Off*** or ***TL1***, then press ***ENTER***. OFF = alarm reports are not processed. TL1 = TL1 report messages processed via the TL1 port.

`Report Retry Time:`	Type the number of minutes that the system will wait before attempting to contact the user with a callback, User Report, or TL1 report message if the prior attempt failed (0-1440 minutes, with 0 representing no retry), then press ***ENTER***. (This retry time has no effect on System Alarm Reporting.)

Note: *If* "X25" or "Telnet" *was entered above as the Report Device, the system responds with...*
`TL1 Report Condition Interval: current info`
`TL1 Report Condition Interval:`
	This parameter applies only to TL1 commands/messages. Type the number of minutes (as referenced from midnight each day) that the system will wait before contacting the user with another Report Condition message (0-1440 minutes), then press ***ENTER***. As an example, if a time period of 90 minutes is specified, the system will report at Midnight, 1:30 am, 3:00 am etc. A value of '0' disables sending of Report Condition messages.

Note: *If "Modem" or "E-mail" was entered above as the Report Device, the system responds with...* `Occurred Alarm Report (Y or N):`	Type ***Y*** if the user requires an occurred "User Report" and ***N*** if not, then press ***ENTER***. An occurred "User Report" is a report of any new alarms that have occurred on the user's channels.
Note: *If "Modem" or "E-mail" was entered above as the Report Device, the system responds with...* `Retired Alarm Report (Y or N):`	Type ***Y*** if the user requires a retired "User Report" and ***N*** if not, then press ***ENTER***. A retired "User Report" is a report of any alarms that have cleared on the user's channels.
Note: *If "Modem" or "E-mail" was entered above as the Report Device, the system responds with...* `Persistent Alarm Report (Y or N):`	Type ***Y*** if the user requires a persistent "User Report" and ***N*** if not, then press ***ENTER***. A persistent "User Report" is a periodic report of any alarms that still exist on the user's channels.

SET USERS

Note: *If "Y" was entered above, the system responds with...* `Persistent Alarm Report Period:`	Type the number of minutes (as referenced from midnight each day) that the system will wait before contacting the user with another persistent "User Report" (0-1440 minutes), then press ***ENTER***. As an example, if a time period of 90 minutes is specified, the system reports at Midnight, 1:30 am, 3:00 am, etc.
Note: *If "Modem" or "E-mail" was entered above as the Report Device, the system responds with...* `Daily Report (Y or N):`	Type ***Y*** if the user requires a daily "User Report" and ***N*** if not, then press ***ENTER***.
Note: *If "Y" was entered above, the system responds with...* `Daily Report Command:`	Type the standard system command or user programmable command (30 characters maximum) that the system will issue to generate the daily "User Report", then press ***ENTER***.
Note: *If "Y" was entered above, the system responds with...* `Daily Report Time:`	Type the desired time that the user wants to be contacted with the daily "User Report" (format HH:MM), then press ***ENTER***.

Note: *If "X25" or "Telnet" is selected as the REPORT DEVICE and "TL1" is selected as the REPORT MODE, the following statement appears if the user has any channels configured which do not belong to an Access Identifier group.*
`The following channels will be removed from the user's channel configuration because they are not associated with an access identifier:`
`Save changes (Y or N):`
	Type ***Y*** if the above entered data is to be saved in the user configuration and ***N*** if not, then press ***ENTER***.

Note: *If "Y" was entered above, the system responds with...* `Edit User Channels (Y or N):`	Type ***Y*** if it is desired to add or delete specific system channels from the user configuration and ***N*** if not, then press ***ENTER***. Channels which are a part of a user configuration are the only channels that the system will process for the above User Reports or TL1 reports. Users configured to report via a TL1 network can only specify channels that have been configured as part of an access identifier.

Note: *If "Y" was entered above, the system responds with...*
`Enter channel (e.g. A0012 or A0001-0006) or D to display.`
`Add Channel:`
Note: *If "X25" or "Telnet" is selected as the REPORT DEVICE and "TL1" is selected as the REPORT MODE, the following statement appears if the user tries to add a channel(s) which does not belong to an Access Identifier group.*
`Channel not configured properly for TL1 reporting.`
	Type ***D*** to display a complete list of channels in the user configuration.
	Type the number(s) of all additional channels to be added to the user configuration, then press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channels (e.g. A0001-0008, L0001-0012). To exit, press ***ENTER*** without specifying a channel.

SET USERS

`Enter channel (e.g. A0012 or A0001-0006) or D to display.` `Del Channel:`	Type ***D*** to display a complete list of channels in the user configuration. Type the number(s) of the channels to be deleted from the user configuration, then press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channels (e.g. A0001-0008, L0001-0012). To exit, press ***ENTER*** without specifying a channel.

Adding or Deleting Channels from the User Configurations

The user configurations can be changed in the regards of adding or deleting channels by using the command SET USERS. The command SET USER was described earlier in this section. Channels can also be added to or deleted from the currently logged on user's configuration through the command SET CHANNELS which is described below. These commands are also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Note: *Users configured to report via a TL1 network can only specify channels that have been configured as part of an access identifier.*

Command SET CHANNELS: Channels can be added to or deleted from the currently logged on user through the use of this command. This command is available to users programmed for access to level 6 commands.

SET CHANNELS

`Command <6>: SET CHANNELS`	Type ***SET CHANNELS***, then press ***ENTER***.

`Enter channel (e.g. A0012 or A0001-0006) or D to display.`
`Add Channel:`
Note: *If* "X25" or "Telnet" *is selected as the REPORT DEVICE and "TL1" is selected as the REPORT MODE, the following statement appears if the user tries to add a channel(s) which does not belong to an Access Identifier group.*
`Channel not configured properly for TL1 reporting.`
	Type ***D*** to display a complete list of channels in the user configuration.
	Type the number(s) of all additional channels to be added to the user configuration, then press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channels (e.g. A0001-0008, L0001-0012). To exit, press ***ENTER*** without specifying a channel.

`Enter channel (e.g. A0012 or A0001-0006) or D to display.` `Del Channel:`	Type ***D*** to display a complete list of channels in the user configuration. Type the number(s) of the channels to be deleted from the user configuration, then press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channels (e.g. A0001-0008, L0001-0012). To exit, press ***ENTER*** without specifying a channel.

Setting Alarm Class Names

If Alarms are to be classified by the Alarm Class feature, enter a name for each of the available Alarm Classes.

Procedure:

1. After logging onto the system, type ***SET CLASS***. Then press ***ENTER***.

   ```
   Command <6>: SET CLASS
   Programmable Alarm Classifications
   K1.none  K2.none  K3.none  K4.none  K5.none  K6.none  K7.none  K8.none
   ```

2. Type the number of the Alarm Class to be named (***1*** to ***8)***, then press ***ENTER***.

   ```
   Which alarm class(K1-8) ?
   ```

3. Type the name of the Alarm Class(5 characters maximum), then press ***ENTER***. ***Note:*** To delete a name, just enter a ***SPACE*** then press ***ENTER***.

   ```
   Alarm Class Name:
   ```

4. Repeat this procedure to name the other Alarm Classes.

Changing System Alarm Reporting or Individual User Reports

Parameters of individual User Reports and/or System Alarm Reporting were determined using the command SET SYSTEM. System Alarm Reporting parameters can be changed as described below. Refer to the command SET USERS in this section if it is desired to change individual User Reporting parameters. Both types of alarm reporting (System Alarm Reporting and individual User Reports) also required certain User parameters to be determined. These include primary phone number, valid times for primary phone number, alternate phone number, primary Email, alternate Email, report device, and report mode. These parameters can also be changed through the command SET USERS. If the reporting mode of any user configuration is set for pager, enter the unit pager code through the command SET UNIT. Each user can be configured individually to be notified of an alarm report through a pager. If the reporting mode is Email, set Email parameters via the SET EMAIL command. Also set IP parameters via the IP ADDRESS, IP NETMASK, and IP GATEWAY commands. The channels that are reported as part of a System Alarm Report are set by configuring the appropriate channels for this feature.

System Alarm Reporting: The System Alarm Reporting parameters can be changed by using the commands SET SYSTEM and SET REPORT. The command SET SYSTEM was described earlier in this section. Both commands, when entered, will display a header that contains the current configuration. Then, individually, the commands will list each item that can be changed, prompting for new or revised information to be entered. If the current information does not need to be changed, press ***ENTER*** to continue.

Command SET REPORT: The various System Alarm Reporting parameters that can be changed through this command are described below. This command is available to users programmed for access to level 6 commands.

SET REPORT

`Command <6>: SET REPORT`	Type ***SET REPORT***, then press ***ENTER***.
`System Alarm Report Mode:`	Type ***Single*** or ***Continuous*** if the system is required to initiate an alarm report if any channel alarms and ***Off*** if not, then press the ***ENTER*** key. ***Note:*** *Single=System Alarm Report is considered successful if the system connects with a modem or sends an Email. (Alarm report transmitted once.)* *Continuous=System Alarm Report is considered successful if the user issues an ACKnowledgement. (The system continues to issue the report at an interval determined by the "retry time" until the ACK command is entered by the user.)*
`User Calling Sequence:`	Type the numbers (1-8), which correspond to individual users, in the required calling or Emailing sequence, then press the ***ENTER*** key. The user calling or Emailing sequence lists the users in the order in which the system will attempt to call or Email to communicate an alarm report. Once the system notifies a user, the sequence is reset to the first user, ready for the next alarm report. ***Note:*** *A maximum of 20 digits can be entered.*
`Retry Time:`	Type the required retry time (0-1440 minutes, with zero representing no report retry), then press the ***ENTER*** key. The retry time is the time interval between the calling or Emailing of the last person designated in the user calling sequence list and the recalling or Emailing of the first user in the sequence in the event of an unsuccessful attempt to report an alarm condition.
`Auto-Logoff Time (seconds):`	Type the required auto-logoff time (30 to 600 seconds), then press the ***ENTER*** key. If a user is remotely communicating with the system, and the system needs to issue an alarm report to a remote terminal, the system issues a priority message to the user, and automatically logs the user off. The auto-logoff time period is the interval the system waits with the pending report before issuing the priority message, and logging the user off.

Configuring Channels Into Groups

If the command CONFIG is entered, the system will ask that you identify which group you wish to modify. Another way of entering the command is to identify the desired group in the command line by typing the group number after the characters CONFIG (ex. CONFIG G1). Channels can be added to or deleted from a group, or the name of the group can be changed through the use of this command as described below. This command is also described in "Commands" of the *User Instructions* (Section 5847). Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system. This command is available to users programmed for access to level 6 commands.

CONFIG G_

`Command <6>: CONFIG G1`	Type ***CONFIG G1***, then press ***ENTER***.
`Name:`	Type the desired name for this group (30 characters maximum), then press ***ENTER***.
`Enter channel (e.g. A0012 or A0001-0006) or D to display.` `Add Channel:`	Type the number of the system channel (or channels) that will be added to this group, then press ***ENTER***. Add all of the required channels as just described. When there are no more channels to be added to the current group, press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channels (e.g. A0001-0008, L0001-0012). To exit, press ***ENTER*** without specifying a channel. ***Note:*** *Type "D" to display a complete list of channels in this group.*
`Enter channel (e.g. A0012 or A0001-0006) or D to display.` `Del Channel:`	Type the number of the system channel (or channels) that will be deleted from this group, then press ***ENTER***. Delete all of the required channels as just described. When there are no more channels to be deleted from the current group, press ***ENTER***. Channels can be specified by entering a single channel number (e.g. A0001, B0008), or by entering a range of channels (e.g. A0001-0008, L0001-0012). To exit, press ***ENTER*** without specifying a channel. ***Note:*** *Type "D" to display a complete list of channels in this group.*

Resetting Defaults

This procedure shows the user how to return the parameters listed in Table 15 to their factory default settings using the command SET DEFAULTS. Refer to "Commands" of the *User Instructions* (Section 5847) for a typical screen display. Section 5847 can be accessed via the CD (Electronic Documentation Package) furnished with your system.

Note: *Executing this command will destroy information that has previously been programmed by a user. All channel configurations are also returned to factory default settings.*

Procedure:

1. After logging onto the system, type ***SET DEFAULTS.*** Then press ***ENTER***.

   ```
   Command <6>: SET DEFAULTS
   ```

2. The system responds with...

   ```
   Execution of this command will DESTROY ALL SYSTEM CONFIGURATIONS and could result in ALARM
   CONDITIONS !!
   Do you wish to set defaults (Yes or N)?
   ```

3. Type ***YES***, then press ***ENTER***.

4. The system responds with...

   ```
   Setting system defaults.
   Initializing Analog I/O cards.
   ```
   (only displayed if Analog circuit cards are installed in the system)
   ```
   Defaults set.
   ```

5. Log off of the system. This completes the procedure.

Table 15. Default Settings for System Parameters

Parameter	Default Setting
Unit Name	Central Office
Unit Number	1
Unit TCP/IP Address	192.168.1.1
Unit GATEWAY Address	192.168.1.1
GET Community String	public
SET Community String	private
Trap Addresses	(none set)
SNMP Version (for traps sent)	V2
Number of Rings before Answering	1
User Timeout Period	300 seconds
Logon Password	Number of Access Level Required (1-6)
System Alarm Report Mode	Off
User Calling Sequence	(none defined)
Retry Time (System Alarm Report)	10 minutes
Auto-Logoff Time	60 seconds
Sequencer Standby Start Delay	15 seconds
Sequencer Failsafe Timer	60 seconds
AC Restoration Qualification Timer	0 (disabled)
Rectifier Sequencing Routines	Y

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NetSure™ LMS Data Processing Unit

Installation Instructions, Section 5879 (Issue BA, April 7, 2014)

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Issue BA, April 7, 2014